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Tuberculosis (all forms) caused	41,103	deaths,
As compared with—	50,389	from cancer,
	37,786	„ bronchitis,
	36,970	„ pneumonia,
	60,650	„ cardiac diseases,

The items thus tabulated are not strictly comparable, for tuberculosis when fatal is usually the predominant disease, whereas bronchitis and pneumonia frequently are secondary to other infections or to non-infectious diseases; and cardiac diseases should be regarded as the end-product resulting from earlier infections, especially by the rheumatic virus and the *Treponema pallidum*.

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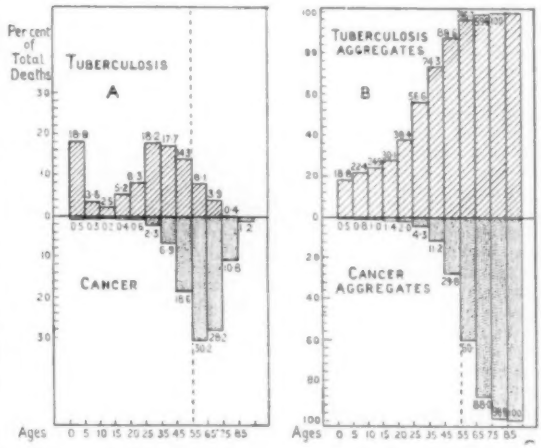
FIG. 1.



England and Wales, 1901–10: A, Percentage of total male deaths at all ages from tuberculosis and cancer which occur at each age-period. B, Ditto at each and all lower age-periods. Taken from the author's "Elements of Vital Statistics" by kind permission of Messrs. Allen and Unwin.

CHILD TUBERCULOSIS.

The marked reduction of registered tuberculosis in the first five years of life calls for separate comment. Prior to 1910 the death-rate at these ages was higher than that at any subsequent period of life; but latterly this has ceased to be so, probably because with increasing accuracy of registration, deaths formerly ascribed to tabes mesenterica or to tuberculous meningitis are now only so returned in most instances as the result of more careful weighing of evidence. That there has been a real decline in tuberculosis at ages under 5 is undoubted, for these ages can scarcely have escaped the influences causing a reduced death-rate at higher ages. It would appear that some of the decline shown in the curve at ages 0–5 is actual, while some is due to changes in death certification. This, however, does not complete the story as to tuberculosis in childhood. Owing to difficulties in diagnosis it is probable that many deaths from acute general tuberculosis in childhood remain unrecognised, and that many cases, for instance, of so-called bronchitis and broncho-pneumonia, represent a rapid explosion of acute tuberculosis.

Even if we take the official figures at their face value, and assume that there has been as large a decrease in child tuberculosis as is shown in them, it is none the less true that in childhood the tubercle bacillus still claims a vast number of victims, probably

more than at any later age-period of life. Hence one of the most urgent problems to be studied in public health administration, and in the work of every practitioner in medicine, is *how to minimise risks of infection during the first five and especially during the first two years of life.* The removal of risk from infected milk or its great reduction only covers a fraction of the danger; for exact observation has shown that only a minority of cases of non-pulmonary tuberculosis, the chief form of tuberculosis in children, are of bovine origin. The continuance and extension of precautions in respect of milk is most important; but this alone leaves the major problem of prevention of infection, that from human sources, unsolved.

The study of the epidemiology of tuberculosis, as elucidated by Dr. G. E. Bushnell, by Metchnikoff, Calmette, and others appears to point to the conclusion that each infant at birth may be, and probably is, in a similar position in respect of tuberculosis to that of remote races when first exposed to this disease. Both in children and in the adults of hitherto non-tuberculous communities when invaded by tuberculosis there is a very high mortality and the tuberculosis is of an acute and rapid type. Even in urbanised communities like England the high peak of mortality in the first five years of life, a peak which is probably now understated (Fig. 2), may be regarded as good evidence of the initial lack of immunity of young children. Those children who receive smaller doses of infection become "naturally vaccinated" (Metchnikoff), or it is conceivable that in some instances larger doses are resisted by children with higher resistance. Thus after infancy the survivors in thickly populated countries secure a partial immunisation against tuberculosis in later life. It has been suggested that this partial immunisation may be produced by tuberculous cows' milk derived from a mixed herd; but there is no evidence of this so far as respiratory tuberculosis is concerned; and as regards non-pulmonary tuberculosis, which is commonly not fatal, its strikingly reduced frequency is more satisfactorily explicable by the fairly general substitution of pasteurised for uncooked milk and by the reduction in human sources of infection.

RACIAL SUSCEPTIBILITY AND CHILD INFECTION.

The facts as to child tuberculosis do not necessitate the assumption that there exist real racial differences in liability to fatal tuberculosis. The experience of the Irish and Negroes at one end of the scale and of Jews at the other, is commonly adduced as indicating real racial differences. It is difficult, however, to separate the essential influence of heredity in race from collateral differences of social life, of personal habits, of cleanliness, and of varying degrees of exposure to infection; and it is preferable therefore to suspend judgment under this heading.

There remains, as already indicated, the question as to why certain children survive and others perish after infection by tuberculosis. The two results are seen in the same mixed community and in the same family; and although it may be that in the same family, for instance, differences of susceptibility occur, the difference is most naturally explained by assuming that what follows—whether partial immunisation or death—depends primarily on the number of occasions on which infection has been received and on the aggregate dosage of this infection. The somewhat comparable case of diphtheria comes to mind. The infant at its birth appears to possess some partial immunity, probably derived from the maternal circulation. This disappears, but later, as shown by the Schick test, the child develops its own immunity, as the result of minimal doses of casual infection, unless before this happens it is infected by an overwhelming dose of infective matter.

But the case of diphtheria suggests another possibility—viz., that immunity is acquired by infection from a less virulent type of diphtheria bacillus and is not merely consequent on a reduction in the number of invading bacilli; and may not this also occur in tuberculosis? There is no direct evidence as to this, but whether it be so or not, if Calmette's current experimental work is confirmed, there may be opened out great possibilities of protection of children in consumptive families in this direction. Meantime it is a counsel of practical wisdom to assume that minimum dosage of virulent bacilli occurs in instances of safe recovery from tuberculous infection; and on this assumption public health administration must regard itself as anxiously concerned to adopt measures which will minimise during childhood exposure to infection from tuberculous patients. This emphasises the importance of continuous and detailed care in respect of housing for tuberculous adults, including the inculcation of careful precautions as to coughing and fondling, as to cleanliness of hands and handkerchiefs, and the provision of separate bedroom accommodation, either at home or in a sanatorium or hospital. Even if cases of open tuberculosis cannot be continuously segregated—whether functionally at their homes, by the taking of rigid precautions and by separate bedrooms, or geographically in institutions—this can be done intermittently, and there is every reason for believing that discontinuity of infection greatly reduces risk of effective infection of the exposed. The alternative plan of removing children to summer or seaside homes is sometimes practicable, and this has a range of utility which has been more fully appreciated in France than in England.

The special need to protect children during the first few years of life will remind public health workers of the similar need for preventing children of the same age from acquiring measles, as it is then many times more fatal than later in life. Both child hygiene workers and tuberculosis workers should increasingly act in the closest combination if infants are to be safeguarded against tuberculous infection, from which they have not yet had time to acquire partial immunity by gradual and small-dosed infection; and here is, in my view, one of the most promising and fruitful lines of public health work. According to a statement of Landouzy some years ago, 27 per cent. of the total deaths from all causes in the first two years of life are due to tuberculosis. The English official records give this proportion as only 3·3 per cent. The truth lies somewhere between these two extremes; but even the lower figure means that mischief is so great as to call for more strenuous efforts for the protection of young children. It is significant that a large part of this danger occurs in the "crawling" stage of childhood, and the need for avoiding infection of toys and fingers at this stage is very great.

RESPIRATORY TUBERCULOSIS.

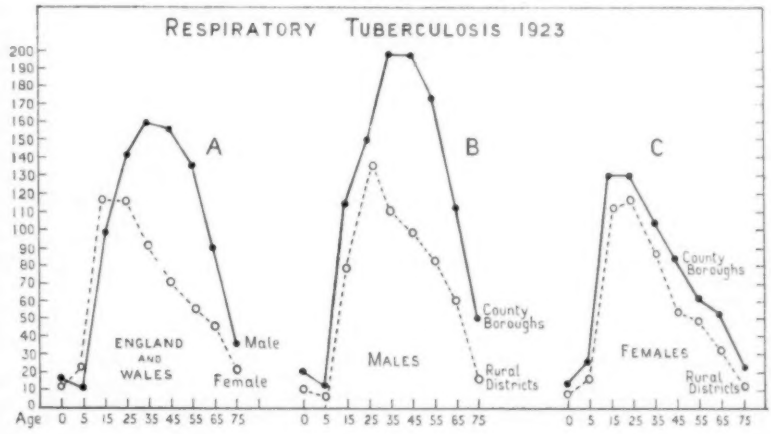
After childhood respiratory tuberculosis is the chief form of fatal tuberculosis; and we next consider the age-incidence of respiratory tuberculosis (Fig. 3). It will be noted that for England and Wales as a whole (Fig. 3, A) in 1923 the death-rate from phthisis in females reached its maximum at the age-period 15–25, being only slightly lower at the age-period 25–35, while for males the highest death-rates were at ages 35–55. It will be noted, furthermore, that at the age-period 15–25 the female death-rate was higher than that for males. At all later ages the male is higher than the female rate; and it is evident that men are exposed to infection, or to inimical influences which bring infection into dangerous activity, to a much greater extent than are women. Some light on this point is thrown by contrasting the curve for males in rural districts (Fig. 3, B) with that for females in England as a whole. These two tend to approximate, but even in rural districts the death-rate of men aged 25–35 is much higher than that of women generally. How far migration to and from towns affects these results can only be guessed.

The difference between males in rural districts and in the larger towns is striking (Fig. 3, B). Living and working in our great towns, with the added dissipations of town life, imply a heavy additional phthisis rate, though happily the difference between urban

and rural death-rates, as decade follows decade, is declining.

Perhaps the most striking curves are shown in Fig. 3, c. There is a remarkably small difference between the urban and rural death-rates for women; and it would certainly appear that tuberculosis need be no more serious a disease in town than in country. This is explicable in several ways. It may be regarded as additional evidence that the sources of danger in urban life are industrial and convivial—e.g., in public houses, from both of which dangers women commonly escape. An additional factor may be that consumptive men in towns can obtain institutional treatment at an earlier date and longer in duration than is obtainable in rural districts, and their families receive less massive infection than rural families. This last difference, if it exists, will gradually disappear; and the increasing proximity of the rural to the urban death-rate from phthisis points in the same direction.

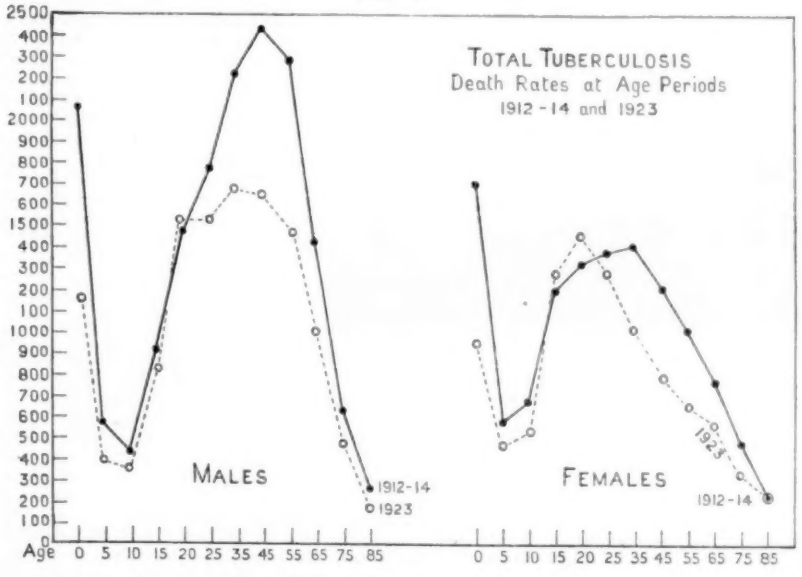
FIG. 3.



In different countries, in various parts of the same country, and at different periods, Dr. J. Brownlee has shown that the age-incidence of maximum death-rate from phthisis may occur in early adult life, say 20–25 years, in middle age from 45–55, or in persons over 55, and has suggested that these variations may imply that phthisis is a group of three diseases. But the fact that in different parts of the same country and in the two sexes each of these types of age-incidence may be seen at the same time does not support this hypothesis, and it is more in accord with our general knowledge of the disease to maintain that the differences in age-incidence of phthisis at different periods and in different communities are due to the varying extent to which the causes of tuberculosis are at work. The disease tuberculosis is the product of two sets of circumstances—an adequate dosage of infection, and conditions favouring or impeding successful invasion of the disease; and as both dosage of infection and circumstances favouring its development vary greatly in different communities and social strata, it is reasonable to anticipate differences in age and sex distribution of the disease, the hypothesis of three types of disease being unnecessary.

We may next examine the historical course of the death-rate from all forms of tuberculosis. This is shown for England and Wales in Fig. 4, reproduced from a chart prepared for the New York Tuberculosis Association. Two things stand out in this diagram, first, the steady and continuous course of decline, which is unmistakable since the early 'seventies; and secondly, the fact that as the amount of pulmonary tuberculosis declines, so still more does that of non-pulmonary tuberculosis.

FIG. 2.



RATE OF DECLINE.

The curves for New York City and for the registration area of the United States, derived from the same source, bring out the facts that (1) although the death-rates are higher than those in England, they show since 1900 a similar decline, with a much smaller interruption in 1918; and (2) they further illustrate the point already made earlier in this address that the city death-rate is rapidly approximating that of the registration area of the United States as a whole, the population of half of which is still in rural districts. Similar curves dealing with respiratory tuberculosis in England and Wales bring out the steady decline in the phthisis death-rate from 1870 onwards. Evidently for a long series of years, in the complexity of modern social and economic conditions in England, factors have been at work which on balance have led to a steady rate of decline of the tuberculosis death-rate; and there is no confirmation of the title or the substance of Prof. Pearson's contribution to *Biometrika* (1918-19, vol. xii.) on "The Check to the Fall in the Phthisis Death-rate since the Discovery of the Tubercle Bacillus and the Adoption of Modern Treatment." There had been no check in the rate of decline prior to the Great War.

It is true that in 1924 the national death-rate from phthisis was almost the same as in 1923, but it was lower than in any preceding year; and we must have the experience of several more years before we can begin to think that the English death-rate is incapable of sinking as low as, or lower than, the present New Zealand death-rate shown in Fig. 5.

CAUSES OF DECLINE.

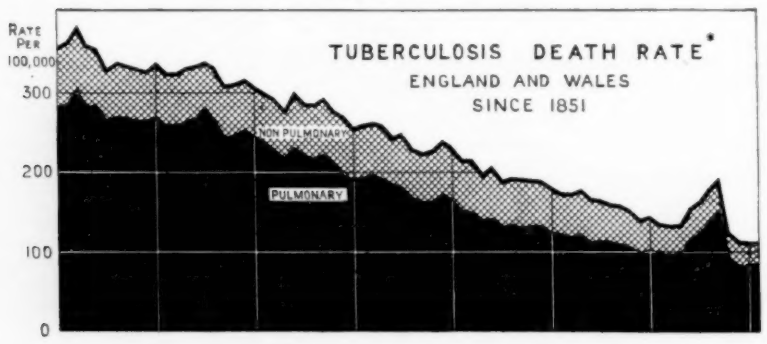
I have referred to the influences causing decline of tuberculosis in England and in other countries. What have these been? What, for instance, has been occurring to cause the improvement shown in several countries, though to a varying extent, in Fig. 5, also derived from the Research Service of the New York Tuberculosis Association?

MEASURES DIMINISHING INFECTION.

I limit the inquiry to the human which is the major source of tuberculosis in man. Two changes must, in my judgment, be placed first in order of importance: (1) There has been a great improvement in the cleanliness of the population, domestically and industrially, especially in regard to coughing and expectoration. The magnitude of this improvement it would be difficult to exaggerate. It amounts to a revolution in personal habits, the exceptions to this statement being few as compared with the experience of a few decades ago. (2) Along with this has proceeded a great improvement in the treatment of disease generally, and of tuberculosis, both at home and in hospitals. Carefully closed and warm bedrooms occupied in common by sick and well have been replaced largely by separate and well aerated bedrooms for the sick; and a steadily increasing proportion of the sick are treated in hospitals.

In 1869–70 the death-rate from respiratory tuberculosis in England and Wales was 244 per 100,000 of population. At that time 8·3 per cent. of the total deaths from all causes occurred in public institutions. In 1919–20 the phthisis death-rate was only 92 and the proportion of institutional deaths was 24·3 per cent. Taking the whole of England and Wales it is noteworthy that over a third of male deaths and more than a quarter of female deaths from phthisis now occur in hospitals, commonly after prolonged and often repeated stay of the patients in these institutions. For London about half the total deaths from phthisis occur in institutions; and the proportion in large American cities is quite as high.

FIG. 4.



The present universally accepted policy for cases of open tuberculosis is to urge that every possible precaution against infection shall be taken, and that whenever practicable institutional treatment shall be secured, at the least during acute exacerbations of disease. It is not unreasonable, to put the matter at its lowest, that the same practice which is now universally regarded as important in the interest of the community, should have borne a large share in bringing about the historical reduction of phthisis mortality which has been experienced. And we know that this practice has been increasingly in operation. As factors opposing reduction of phthisis have increased—more dense aggregation of populations, replacement of outdoor by indoor occupations, and the reduction of house room which always goes with town life—so has the hospitalisation of consumptives increased; and hospitals from this point of view must be regarded as an important, indeed an essential, extension of housing accommodation in modern circumstances of life. The more important factors for and against reduction may be thus summarised:—

Factors Making for Reduction.—(1) Gradual substitution of small-dosed and infrequent in lieu of large-dosed and frequent infection, and especially (*a*) increased cleanliness in personal habits (spitting, &c.), (*b*) reduction of dust and of infection in industrial life, (*c*) better care and segregation of the sick. (2) Increased resistance by improvement of general hygienic conditions, including miproved nutrition, and diminution of industrial dust. (3) Provision of means for prompt diagnosis and continued treatment of tuberculosis, dispensaries, residential institutions, open-air schools, &c.

Factors Opposing Reduction.—(1) Steady increase of town life. (2) Increasing replacement of outdoor by indoor occupations. (3) The reduction in house-room which goes with town life.

The experience of Norway which I have discussed elsewhere need not be further emphasised here. It offers a crucial instance of the effect of segregation in reducing almost to the point of extinction a chronic infective disease like leprosy, which, although much less actively communicable, has many points of resemblance to tuberculosis. From other European countries leprosy had already disappeared; but in Norway it lingered until a steady system of segregation of cases was practised. Sir Leonard Rogers has shown a similar course of events in some other countries in which segregation of known cases has been introduced.

INFLUENCE OF NUTRITION.

It will be remarked that improved nutrition appears also in the preceding tabular statement as an important factor in reducing mortality from tuberculosis. There is some ambiguity in the use of this phrase, just as there is in the diagnosis of malnutrition in a large proportion of the children attending school. In the latter case, unless a further analysis is pursued, the implication is that what is needed is more milk and other foods. Commonly this is the need; but the malnutrition may be caused also by some disorder or disease requiring treatment, by deficient sleep, by general defects of hygiene, or some other cause; and a "nutrition clinic," in the sense of a scientific, including a social, diagnosis of the special case is called for before we decide that the supply of additional food is the only or even the main necessity. So also when it is assumed that better and more abundant food is largely responsible for the lowered mortality from tuberculosis, one cannot be satisfied with this imperfect analysis of circumstances. Improvement in cheapness and abundance of food and in purchasing power has been associated historically sometimes with large and sometimes with insignificant reductions in the death-rate from tuberculosis: and even in the treatment of tuberculosis, over-feeding, in the sense of high calories and especially of a large meat diet, plays a much smaller rôle in the attempt to increase resistance to the intruded infection than, in the minds of physicians, it has done in the past. This is true for nutrition as stated in terms of calories. Whether it is so for special

articles of diet is not so certain. In view of our rapidly increasing knowledge of the specific value of auxiliary foods and allied substances in the prevention and treatment of scurvy, rickets, goitre, and beri-beri, it is conceivable that some deficiency in the dietary of the Irish may play a larger part in the excessive death-rate from phthisis shown in Fig. 5 than an appeal to special racial proclivity, in which we are too ready to find refuge. It is still more likely that better treatment of tuberculous patients, improved housing, and a growing appreciation of the need for cleanly habits have borne a chief part in the reduction of the Irish phthisis rate shown in recent years.

OTHER FACTORS IN THE WAR.

And it may be that the lack of certain special elements of food—especially fats—played a considerable part in causing the increase in the death-rate from tuberculosis shown in Fig. 5 in the English and German curves during the war. Defective nutrition, whether of some specific character or more generally, doubtless played a part in bringing about what earlier in this address I have called effective infection. But other factors were at work, and it is difficult to ascribe to each of them their true weight. In England nearly all workers suffered during the war from overwork, itself a factor facilitating and liberating infective material. There was an enormous increase in the industrial employment of women, who were commonly aggregated in special centres in circumstances of overcrowding. Then in 1918–19 there occurred the terrible invasion of influenza, which, as shown in the English experience of influenza in 1889–90, means an excessive and hastened mortality among tuberculous patients. The coincidence of the two events in the more recent experience is shown below.

Death-rates per Million Living among Females.

		1915	1916	1917	1918	1919	1920	1921	1922
From influenza .	Fem.	272	232	183	*2983*	1104	255	226	559
„ respiratory tuberculosis	Fem.	915	920	975	*1070*	856	757	777	766
	Male	1410	1447	1525	*1615*	1173	1003	1003	1024

The influenza epidemic undoubtedly bore a share in increasing the phthisis death-rate in 1917–19. So also did the circumstances of overcrowding and overwork of war time. The great improvement in infantile mortality during the war, the vast decrease in alcoholism and its consequences, and the release of an unusual proportion of greatly increased earnings for food, makes it unlikely that English civilians suffered severely from malnutrition, except as regards butter and other fats, which may be regarded as having special importance.

Heredity.—In the preceding rapid sketch I cannot pretend to have more than indicated some of the problems associated with the incidence of tuberculosis. Nor have I enumerated all these problems. There are still some among us who attach importance to heredity as an important predisposing influence in the causation of tuberculosis. With advance of knowledge this view becomes increasingly nebulous; and most of us probably are convinced with Robert Koch (quoted by Dr. William H. Welch) that "predisposition is merely proximity to the bacillus." The terrible toll—probably much understated in the official figures—taken by tuberculosis on child life does not support the view, that in increasing proportions the survivors in successive generations have

FIG. 5.

Death-rates from pulmonary tuberculosis, 1900–22, in various countries.

Cyclical Factors.—Nor can we be said to possess satisfactory evidence of cyclical factors in the epidemiology of tuberculosis, to which importance is sometimes attached. It is futile to base such an hypothesis on the proportion of deaths from phthisis to total deaths from all causes, unless it is proved that the variability of one quantity of the total deaths can be eliminated from the proportion. Even were such cyclical changes to be demonstrated, and tuberculosis were thus placed in the same category as, for instance, influenza, cerebro-spinal fever, diphtheria, and scarlet fever, the classification would add but little to our knowledge. To rest in such a classification is to invite mental and moral sterility. We need to remind ourselves that but a few years or decades have passed since malaria, yellow fever, plague, enteric fever, and cholera were quite legitimately—and even now can be—placed among diseases influenced by imperfectly known cyclical conditions. But they have all been brought within the range of active preventive gradually become more resistant to tuberculosis than in the past. The truth rather lies in the statement that infants in every community and adults who have lived remote from urban conditions, especially in primitive life, are both alike in not having run the gauntlet of repeated small doses of infection, and are therefore prone to suffer from acute general tuberculosis.

measures, and no one is disturbed by the consideration that if our present preventive measures succeed in eliminating any or all of these diseases a non-immune population will result from our efforts. In England enteric fever is losing its annual seasonal autumn rise, it has almost ceased to increase greatly in prevalence in warm and dry years; and we look forward to the rapidly approaching time when it will have become as nearly extinct as typhus fever. And we may content ourselves with the reflection that although for many generations to come it is unlikely that the majority of the people in civilised countries will cease to be invaded by diminishing doses of tubercle bacilli, there is no reason why, given the universal application of knowledge already in our possession, the reduction of the present death-rate from tuberculosis should not continue, thus removing from our midst one of the chief causes of poverty and social misery.

FUTURE ACTION.

After this necessarily incomplete review of some of the factors concerned in the prevention of tuberculosis, we may in conclusion name some practical considerations arising from it. Our chief aim must be to minimise infection, especially at the most susceptible ages, and to promote all efforts of child welfare work and every branch of public health work which, whether by controlling epidemic diseases, by improving housing, or by securing improved occupational circumstances, will diminish the risk of arousing latent infection into activity or of renewing and increasing infection. In short, tuberculosis work is a branch of public health work and must be carried on as such, though, of course, not necessarily by the same workers.

Our working of tuberculosis medical organisations, dispensaries, sanatoriums, hospitals, &c., has emphasised the need to link them up with general medicine. This has been evidenced in the detailed work of sanatoriums and hospitals, where physicians and surgeons other than those having special skill in tuberculosis are occasionally required, and particularly in tuberculosis dispensaries, where coöperation between physicians in private and public practice is especially desirable. The ideal towards which the tuberculosis dispensary should approach is that of becoming one division of a medical or health centre for each unit of population, intended for medical consultations in different departments of medicine, and where consultations can take place not only between general practitioners and the staff of the centre, but also between the staff of different parts of the centre. Pending the development of such a general system of consultation services, the present official medical arrangements for the control of tuberculosis need more general support and extension. I need scarcely emphasise in this address the value of free expert medical examination in doubtful cases of tuberculosis, the need for additional hospitals for consumptives, the need for better use of sanatoriums, for the introduction of occupational therapy, and for special workshops for the sick, the need for the employment of many additional visiting nurses, for open-air schools, and for extended care and after-care of tuberculous patients.

Even in the most completely organised city or town it is doubtful whether anywhere the problem of tuberculosis can be said to have been tackled on a scale equal to the needs of the case. There has been too often an impression that when the reporting of cases of tuberculosis has been made obligatory, when laboratory facilities have been provided for examination of sputum, when occasional means for securing an expert medical examination of the invaded family are available, when a public health nurse having a preposterously large visiting-list is provided, when here and there a consumptive is treated for many months in a sanatorium, enough has been done to justify us in being surprised at the absence of startling statistical results. We need to think of the work needed in terms which are commensurate with the magnitude of the problem.

I suggest the following elementary questions as needing to be asked respecting any local arrangements for the control of tuberculosis:—

How do the number of cases of tuberculosis reported compare with the number of deaths from this disease?

How soon after commencing attendance does the practitioner notify his cases?

In what number of doubtful cases is consultation arranged between the practitioner and the tuberculosis officer?

In how many of the cases notified has a medical examination of the rest of the family been secured?

In how many of the cases notified has sanatorium or hospital treatment been provided?

Does the number of hospital and sanatorium beds for tuberculous patients equal the annual number of deaths from tuberculosis?

During institutional treatment has it been an essential part of the arrangements to instruct and train the patient in the hygiene of his future life?

While the patient is away from home have his domestic conditions been investigated, the condition of health of his family ascertained, and such assistance given as is needed to maintain nutrition, or directly or arranged from collateral sources?

After each patient has left the institution, has he been the subject of continued sympathetic visitation and of help to ensure that he has (*a*) occupation adapted to his physical ability, (*b*) a separate bedroom, (*c*) such supplementation of income, when needed, as will secure him from malnutrition.

I might enlarge the list of questions; but the above suffice to show that as work becomes more valuable, more and more work is needed. This is true of good work in every department of life. Efforts to combat evil reveal further avenues for such work. This work is well within the financial ability of every community, and it is equally certain that if undertaken it will repay manifold in the improved health and efficiency of the community. Let me sum up some of the practical points which need to be emphasised.

1. The objects of all antituberculosis measures are to increase the resistance of mankind to infection, and to reduce the amount and frequency of infection to which mankind is exposed.

2. The amount and frequency of infection are greater in consumptive families; and commonly owing to poverty and its associated circumstances, the resistance to infection is at its lowest in such families.

3. The age-incidence of mortality from tuberculosis shows that the risk of acute tuberculosis and death is greatest in the first two or three years after birth. Hence the supreme importance of protecting young children against infection.

4. The excessive incidence of tuberculosis in early childhood and the important part played by epidemic diseases in increasing tuberculosis emphasise the extreme importance of connecting tuberculosis work and child welfare work closely together and of affiliating both to general public health work.

5. Steady educational work is required until the public realise that our present antituberculosis work is sound and beneficent, and that it needs to be extended in every direction. Until we are in a position to say that in every area every tuberculous patient is receiving throughout the whole of his sick-life such care as will give him the best chance of recovery, and which, whether recovery is possible or not, will secure comfort for him, and protection against infection of all who are associated with him we cannot be satisfied. When this can be said, the present rate of decline in the death-rate from tuberculosis will become more rapid, and one of the chief causes of present suffering and distress and the burden of dependent widows and children which follows later will be very greatly decreased.

THE Commander-in-Chief recently performed the opening ceremony of the Connaught Military Hospital at Poona. The hospital occupies the site of the old Station Hospital, which has been much enlarged and equipped with all the latest improvements.

ADVANCE IN MEDICINE.

WITH REFERENCE TO THE CAMPAIGN AGAINST TUBERCULOSIS.

An Address delivered before the North-Western Tuberculosis Society at the University of Liverpool on March 18th, 1926,

BY J. G. ADAMI, C.B.E., M.D. CAMB., F.R.S.,
VICE-CHANCELLOR OF THE UNIVERSITY OF LIVERPOOL.

IT is as a pathologist, I take it, that I am asked to address you, and thus you will forgive me if I speak as a pathologist at large, whereby I mean not according to the more limited and Teutonic meaning of the term as a morbid anatomist pure and simple, but as a student of disease, its causes, course, and results. And as tuberculosis is an infectious disease it follows that, dealing with it, I clearly include bacteriology as part of pathology, nay more, that what I shall have to say must of necessity deal largely with bacteriological data and bacteriological considerations.

I do this the more willingly, since this occasion gives me the opportunity to take up the cudgels on behalf of the pathologist and of pathological advance. In the annual report of the Medical Research Council for 1923–24, published a year ago, its distinguished secretary passed a grave reflection upon pathology in general and British pathology in particular, pointing out that while physiology has of late been progressing by leaps and bounds, pathology, including bacteriology, has been largely at a standstill, particularly in this country, and regarding the pathologists and bacteriologists of to-day as mere laboratory routinists, slaves of the hospitals on the one hand, of the municipal authorities on the other, whose lives are not given over to research but to the provision of diagnoses.

Now, there is a sufficient substratum of truth in these accusations to make them sting. It is quite true that pathology originated in the hospital dead-house, that the earliest pathologists, from Morgagni up until the middle of last century, and in this country up to 1880 or so, were exclusively practising physicians and surgeons, men of the type of Hunter, Addison, Bright, and Paget, and it is as an outcome of this old tradition that pathology remains closely associated with the hospital, with all the great advantages and certain great disadvantages that accrue from this association.

Physiology, the study of the functions of the body in health, had no such essential association, and, in fact, its great weakness until the early years of this century lay in its attempt to regard itself as a pure science, separated from medicine. And if Sir Walter Fletcher, himself a physiologist, exults, and exults with justice, over the extraordinarily good work accomplished by the physiologists of to-day in advancing the science of medicine, it is proper that he should keep in mind that that work demonstrates its practical value precisely as it becomes pathological—i.e., as it becomes applied to the study, not of the healthy body, but of disease. He forgets that each and every experiment devised, be it in a physiological or in a pathological laboratory, upon the elucidation of any one function of the body, is a physiological experiment so far as it throws light upon the normal functioning of the body, is pathological so far as it illuminates that excessive or defective function which constitutes disease: for all disease is the outcome of either excessive or defective function. Increasingly during these post-war years the physiologists have trespassed into pathological territory; until now, for example, Sir Walter Fletcher claims this territory as their own, and evidently has reached the point of doubting whether pathology has any *raison d'être*—whether, in fact, it is a science at all. He and his friends go so far as to hold that the basis of all pathology, the study of inflammation, and of the reaction to injury, is essentially a physiological problem because, forsooth, these reactions are the normal properties of the individual and his tissues, and I suppose they would add that injury is the normal healthy condition of affairs.

What, then, is the truth? A science is not a study associated with some particular form of technique needing particular equipment. Were that so, then assuredly neither physiology nor astronomy, nor, indeed, pathology, are sciences. Just as astronomy is the study of the celestial bodies and comprises everything that has to do with them, their light, their movement, their attraction one to another, their dimensions and composition, so is pathology the study of all that we regard as disease, as distinguished from ease, and there, as a science, it has its limits. And to object that little advance is being accomplished by British pathologists and bacteriologists of to-day is, in the first place, not to estimate justly the work now being undertaken in the university and hospital laboratories of the country, and in the second not to grasp the principles underlying advance in any one science.

The interesting point is that 30 years ago identically the same complaint was being made over the English-speaking world regarding the physiologists—they were not advancing, they were concerning themselves over abstruse problems that had no possible practical application. I remember hearing one rude and outspoken member of a university staff remark that all the elaborate investigations of Burdon Sanderson, Gotch, and others upon the isolated muscle-nerve preparation might with equal edification be performed upon a piece of chewed string. And in medical schools the physiologists were credited with being "remote, unfriended, solitary, slow."

Of course, these criticisms were as unfair as they were rude. These apparently barren years, we now see, were very far from barren. The painfully intense work then accomplished was leading up among other things to the electrocardiograph and a complete revolution in our understanding and treatment of cardiac disease, to a like revolution in our understanding of respiration, to our present methods of diagnosis and treatment of digestive disturbances, to our huge advances in a knowledge of metabolism, and, with this, to the development of physiological chemistry and biochemistry as distinct departments, and, in short, to the happier conditions of to-day when physiology and medicine have realised their dependence one upon the other.

THE CAUSATION OF INFECTIOUS DISEASE.

I am, you will recall, addressing you on the subject of "Advance," and I trust you will forgive me if I build up a little slowly, but all the more surely, my main, or shall I say ultimate, thesis of advance in tuberculosis. Let me, as leading up thereto, take up next the broad subject of the causation of infectious disease in general. What is the story? Is it not that of long centuries in which brilliant hypotheses as to the existence of living but invisible germs of disease from time to time held a temporary sway, until at length in the second quarter of the nineteenth century, with the development of the microscope, certain of the grosser micro-organisms were found constantly associated with particular conditions? Goodsir, for example, in 1826, finding sarcinæ associated with a group of cases of gastric inertia and dilatation, and following this, Schoenlein in the 'thirties finding his achorion associated with favus, Pollender in the 'forties and Davaine in the 'fifties discovering a similar constant association between anthrax and the relatively large bacillus of that disease. Then, following the botanical studies and descriptions of the bacteria by Ferdinand Cohn, we come to the real foundation of morbid bacteriology by Pasteur and Koch in the late 'sixties and early 'seventies. And with that, within the next 20 years, the marvellous development of the new science—following upon the demonstration of an easy and practicable method of obtaining pure cultures and of staining and detecting bacteria—and the laying down of Koch's postulates. What a marvellous time it was, with the rapid discovery one after the other of the causative

organisms of a veritable host of diseases of men and animals! And then swiftly following upon the heels of these discoveries, the development of our knowledge of immunity, of ectotoxins and endotoxins, of vaccines and immune sera. As medical men we were transported into a new world. As regards the infectious diseases, the text-books of medicine written prior to 1880 became of little more than antiquarian interest. And then from 1895 to 1905 the tide of advance slowed down. The last really great discovery was that of Schaudinn of the *Spirochæta pallida* in 1904 which, incidentally, is of course not a bacillus. It is true that there was a separate and later burst of advance in connexion more especially with tropical diseases and the recognition of increasing numbers and species of pathogenic protozoa. But admitting this, how very little apparent advance, or shall I say how very little sensational advance, there has been either in bacteriology or immunology in the last 20 years, say from 1905 to 1925!

This does not mean that during these 20 years there has been any reduction in the number of eager workers and investigators. On the contrary, the number has vastly increased. Think also how vast has been the improvement, both in the number of laboratories and in bacteriological technique during the same period. Think also of the improvement in the standard of laboratory work demanded of the students. It is not, I feel confident, that there were giants between the 'seventies and 'nineties who to-day are non-existent. Nothing of the sort. It is merely that here we have yet another instance of the nature of man's progress, another instance supporting my old friend the late Prof. Bateson's contention that evolution is not by imperceptible, gradual and minute advances, but is by sudden leaps and bounds, followed by long periods with little or no obvious change. It is akin to what time and again we notice in other human activities. Within 20 or 30 years of the introduction of Norman architecture we find built the most superb examples of that style, and for a hundred years or so there is no sensible advance; then Pointed architecture comes in, and again in less than a generation the style is perfected, and so with the Decorated and the Perpendicular styles. Within a generation of the invention of the printing press were produced absolutely the finest examples of printing as regards artistry and clearness of type, perfection of paper, and appearance of the printed page, and that not in one place but in many. Since then we may have developed the mechanical devices of the printing press, the linotype and other methods of composing the page; we may turn out in five minutes more 24-page newspapers than the old time printer could have printed in the year; but for quality and beauty of bookwork the climax was reached close upon 500 years ago, in less than a generation. We celebrated last year the centenary of the railway locomotive—we are to celebrate shortly the centenary of the opening of the Liverpool and Manchester line. By 1840 railway engines were being produced as speedy as any to-day, or as speedy within very few miles per hour. We have improved the haulage power, and have increased efficiency and fuel economy, but to all intents and purposes, by the activities of a vast number of keen engineers testing out this and that, the steam engine was largely perfected within 15 years of the opening of the first railway. After that advance slowed down so as to appear to the onlooker almost to cease, though engineers will tell you of constant attempts at further improvement. The same story seems to be that of the present generation in regard to gas and oil motors, and to be in the process of fulfilment as regards aeroplanes. Underlying and inducing each burst of advance is clearly the discovery of some new technical device of easy general application; in architecture, I take it, the formula for the construction of semicircular, pointed and ogival or two-centred arches respectively: in printing the use of movable type; in mechanical locomotion the invention of a not too cumbrous steam engine; in the motor-car and aeroplane the invention of yet lighter engines, driven not by steam but by the explosion of gases; in bacteriology, in the first stage, the improvement of the microscope, in the second effective stage Koch's application of the botanical method of gaining pure cultures upon solid media, and Ehrlich's utilisation of aniline dyes to stain bacteria. Or, put otherwise, for human advance it is not so much the act of invention or discovery that counts as it is the demonstration of methods of utilisation of the invention or discovery, which are so simple and straightforward that all interested can apply them and confirm their value, and doing this can, by the method of multiple trying out and modification, bring them rapidly to relative perfection. Though always the greatest man of science, the genius of the first water, is he who combines the discovery of a principle with development of a simple means of confirming and applying the principle.

KOCH AND THE BACILLUS TUBERCULOSIS.

Now what is true of the general is true also of the particular. The discovery by Robert Koch of the *Bacillus tuberculosis* and of the means of growing it in pure culture, followed as it was rapidly by the elaboration of means of easy diagnosis, of which the use of fuchsin and the Ziehl-Neelsen stain deserve especial mention, placed our knowledge of the disease upon a wholly different footing. It made it possible for a man like Trudeau, isolated in the wilds of the Adirondacks, with some knowledge of the microscope but no previous training in bacteriology, within a few months not merely to recognise the bacillus but to obtain pure growths, and with these to convey the disease to animals of the laboratory. It gave the death-blow to the prevalent doctrine of diathesis. It showed us that consumption, tabes mesenterica, lupus, white swelling of the knee, spina ventosa, and many other conditions, including pearl disease of the lungs of cattle, were different manifestations of one common disease affecting different tissues and different species. It increased vastly the boundaries of our knowledge and above all it provided us with a sure means of diagnosis. Koch himself, in the years that preceded the publication of his great paper in the *Mittheilungen* of the Kaiserliches Gesundheitsamt, with vast industry demonstrated most of these facts, to have them rapidly confirmed in all parts of the world. It was a marvellous advance in our understanding of one of the great plagues of social life, and for this great investigation and discovery alone Koch must stand out as one of the greatest masters of medicine throughout the ages.

Undoubtedly to Koch and his discovery we owe the campaign against tuberculosis and its spread throughout the civilised world, the abundant provision of hospitals, sanatoria, dispensaries, and district nurses, and all the many means now employed both for the prevention and the cure of the disease, up to the latest provision of artificial sunlight and ultra-violet ray treatment. Yet how very slightly—save in the matter of diagnosis—this bears a direct association to Koch's discovery, how very little the methods we now employ both for prevention and cure have to deal with bacterio-therapy, how largely they are extensions and expansions of methods in vogue long years before Koch's discovery. Bodington introduced the open-air treatment a generation and more before the 'eighties. The treatment of pulmonary consumption by pneumothorax and lung collapse was first attempted here in Liverpool by Dr. James Carson in 1822. Just as in this country in the middle ages leprosy was stamped out without any scientific knowledge of the laws of infection, by segregating those afflicted with the disease in leper hospitals, so, as I heard Koch himself acknowledge at the London International Tuberculosis Congress in 1902 (was it not?) the reduction in tuberculosis mortality, in which this country led the world, dates from the Poor-law legislation of 1834, the establishment of workhouse infirmaries and the segregation of bed-ridden consumptives in the same. Without knowing what they were accomplishing, the Poor-law authorities in this way

weeded out from the crowded houses of the poor the open infective cases of tuberculosis, thereby materially decreasing the opportunities for massive infection with the human strain and steadily reducing its ravages. The remarkable fact, as pointed out recently, is that from the 'fifties onward the reduction in tuberculosis mortality in this country pursues a relatively straight descending line, with no abrupt fall or increasing descent following upon Koch's discovery in the 'eighties.

Disappointed Hopes.

In other words, great as was the advance in diagnosis brought about by Koch's discovery, it was not followed by a corresponding advance in treatment directly dependent upon it. Those of us who, like myself, date their entrance into medicine from the spacious days of the 'eighties, will remember full well what hope we then had, not to say what confidence filled us. Pasteur was producing his vaccines, Behring and Roux their antitoxins and sera. Once the bacillus of tuberculosis was found, it seemed sure that very soon we should possess either a means of vaccinating against the disease or, still better, some bacterio-therapeutical means of arrest and cure. Forty years and more have elapsed, and despite immense and unremitting efforts in laboratories scattered all over the world, only now are we beginning to see light and entering upon the next great period of advance. For this I feel confidently to be the case. And this delay, let me once again emphasise, has not been from any lack of application or lack of genius, but purely from the difficulties of the problem. Koch himself, you remember, tried and failed—failed ignominiously. What hopes were raised when, in 1889, he announced his tuberculin; and with what tragic rapidity they evaporated into thin air.

It may be well to recall here the various lines of attack that have been tried and found wanting. Pasteur and his co-workers had shown that in general the most powerful and long-continued immunity was conferred by the natural disease—i.e., by the activity of pathogenic organisms of normal virulence under such favourable and fortuitous conditions that death did not ensue. Immunity, but apparently of lessened duration and effectiveness, could be gained by attenuating or lowering the virulence of the germ or vaccination proper, and, lastly, by inoculating either the dead bacilli or their products, the soluble poisons produced in the medium of growth outside the body either as active excretions—ectotoxins—or as disintegration products liberated on the death of the bacilli—endotoxins. Very soon it was discovered that there was an extraordinary variation in the mode of reaction of the organism to the different pathogenic microbes and the grade of immunity induced. The tubercle bacillus was evidently totally different from, for example, the diphtheria and tetanus bacilli on the one hand, the typhoid and cholera bacilli on the other. Inoculation either of the dead bacilli or of their products have been almost equally unsuccessful. The most we can say is that they possess a slight preventive capacity and confer a moderate grade of increased resistance which, however, rapidly passes off. As you know, I could spend an hour detailing the many most ingenious modifications of Koch's original tuberculin and derivatives of the bodies of the tubercle bacilli which have been tested, down to Dreyer's Oxford diaplyte vaccine, and what I may term the sensitised vaccine of Rappin of Nantes; the one obtained by treating the virulent bacilli with formalin and acetone (to remove the fatty substances), the other obtained by acting on the dried bacilli with fluoride of sodium, and adding these to serum of oxen subjected to inoculation with the same bacilli.

There is a like history of the attempts to confer immunity by the employment of attenuated strains of the tubercle bacillus. I may remind you that for long years Koch and the Germans strongly upheld the unitarian view of the existence of one type or strain of tubercle bacilli common to all species. Only at the London Congress already referred to did Koch dramatically announce his conversion to the contrary view and announce it as his own discovery, heedless of the previous work of Straus and Grancher in France regarding the specificity of avian tuberculosis, and of Theobald Smith and Dinwiddie in the United States concerning the distinctiveness of the bovine tubercle bacillus. As early as 1889 Grancher and Ledoux, basing themselves on the fact that the avian bacillus is not pathogenic for man, endeavoured without success to utilise the avian strain as a vaccine for human beings. After Koch's pronouncement Behring, in 1902, appeared to have more success in employing emulsions of living human tubercle bacilli to immunise calves against the bovine disease by intravenous inoculation. But while these inoculations did not, it is true, set up tuberculosis, neither did they induce other than a very transient immunity, and, as Stanley Griffith pointed out in 1913, Behring's method of *Jennerisation* had a distinct danger for man, for the human bacilli might be discharged in the milk and so infect the cowsheds and those consuming the milk.

Equal lack of success has followed the attempt made by many to vaccinate human beings with the bovine strain, whether virulent or attenuated, and with the yet more attenuated, non-tubercle producing strains of tubercle bacilli derived from cold-blooded animals like carp and other freshwater fish and tortoises. Personally, I remember vividly the excitement set up by Friedmann and his "turtle" bacillus. When Friedmann came from Berlin to the States I happened to be President of the Montreal Medico-Chirurgical Society. The profession in the United States turned their backs upon him because, instead of distributing his vaccine to all and sundry, he demanded that for the time he alone should administer it. He had, nevertheless, demonstrated his method before accredited societies in Germany and was a qualified physician, added to which he had clearly described the nature of his vaccine, and there was no reasonable doubt that it was as he described it, an emulsion of tubercle bacilli derived from a tortoise or turtle. Rather than make a martyr of him in the eyes of ordinary people, it seemed to the Council of our Society a more politic course to pursue to offer him to select 20 cases from among those willing to undergo his treatment, and to let him treat these on the one condition that, following upon the treatment, the cases should be under the supervision of tuberculosis experts chosen by the Society, who should report upon the progress of the same. I may add that two or three showed definite but temporary improvement, the remainder were unaffected or rendered worse rather than better. The method was obviously inadequate, and the test by no means fulfilled what was claimed by Dr. Friedmann.

It is, I would urge, along these lines that we as a profession should deal with the Spahlinger treatment. Very many of the laity, and some of our profession, are convinced that Spahlinger is both a genius and an absolutely honest man. Do not let us, as a profession, make a martyr of him by refusing to have anything to do with him or his treatment, but on the contrary let us give him full opportunity to prove his contentions by asking him to treat cases selected by himself from a group fully diagnosed, and this under the supervision of well-known experts and under conditions agreed to by both sides as being beyond criticism.

Nevertheless, the studies of the last 45 years have elicited certain indications bearing upon immunity in tuberculosis and showing that it is within the boundaries of the possible. The first of these is that, whereas careful post-mortem examination, confirmed by intradermal and other tuberculin tests, show that at least 90 per cent. of the population at one time or another have been the subjects of tuberculosis, the deaths from this disease are only from about 10 per 10,000 of the population, the total death-rate from all causes being over 130 per 10,000. In other words, tuberculosis is one of the most curable of diseases and the majority of us have developed immunity. The next is that if, as happened during the war, men from the tropics, from regions where tuberculosis is practi-

cally non-existent, are brought to Europe, they rapidly succumb to tuberculosis in large numbers. This may well be interpreted as meaning that one attack of tuberculosis that has been recovered from in youth very largely protects against a later attack, an interpretation confirmed by the common observation that those suffering from lupus or from tuberculous glands rarely exhibit signs of pulmonary consumption; or put otherwise, if 90 per cent. have been infected at one or other time, only 7·5 per cent. of all deaths are from this disease. And these observations are on a par with what Calmette denominates "Koch's phenomenon." It was Koch's observation that tuberculous guinea-pigs react to subcutaneous inoculation of tubercle bacilli in a manner quite distinct from the reaction of healthy guinea-pigs. There is a similar difference when in place of living bacilli dead bacilli or bacillary products are introduced subcutaneously, and this is the basis of the intradermal and other cutaneous methods of diagnosis.

CALMETTE'S RECENT WORK.

And thus I come finally to what I believe is the great advance of to-day—an advance equally important for the prevention of both human and bovine tuberculosis. I refer to the great work of my old friend Prof. A. Calmette, at one time professor in the University of Lille, and then one of the sous-directeurs under M. Roux, but now Directeur of the Institut Pasteur in Paris. I have not hesitated to follow during the last few minutes his development of the subject as given in his latest paper in the February number of the *Annales de l'Institut Pasteur*. From his long years of study of experimental tuberculosis, Calmette concludes on the one hand that a light infection with tuberculosis in infancy is not undesirable, since it confers upon the organism a sufficient power of resistance to protect against later reinfections, provided they are not massive, and certainly protects against a rapidly advancing miliary tuberculosis. On the other hand, he concludes that it is neither practicable nor possible to vaccinate adults who are already infected, and this because of the risk of provoking Koch's phenomenon which he regards as a "phenomenon of intolerance," to this extent, that the reaction it produces in old tuberculous lesions leads too often to caseation and softening and discharge of virulent germs from these foci into the circulation, and so, in some individuals, to a lighting up of what had been a relatively quiescent tuberculosis. He thus concludes that in a heavily infected country—for example, in Europe and the United States—antituberculosis vaccination is only possible among the newly born, or at most in quite young children or animals which from birth have been protected against infection.

For this purpose, after years of work he has found that growing virulent tubercle bacilli in glycerinated ox-bile, an alkaline medium rich in lipoids, and transferring to new medium every fortnight, in four years the cultures become no longer virulent either for cattle or guinea-pigs, although still virulent for the horse and rabbit. After 230 cultures in 13 years the cultures became harmless for all domestic animals. At most, a strong dose inoculated under the skin of a guinea-pig set up a cold abscess which underwent cicatrisation, leaving, it might be, a slight induration. There was no enlargement of the nearby glands.

It is this attenuated bacillus B. C.-G., or *Bacillus Calmette-Guérin*, that he uses for his vaccinations of both calves and new-born infants. Inoculated into various animals it has shown no return of virulence. And abundant experiments have shown that using it young animals not suffering from any pre-existing tuberculosis have the same resistance to tuberculous infection of later acquirement as have animals lightly affected by what may be termed a benign bacillary infection, latent or occult.

But now, upon examining the lymph glands of the animals inoculated with B. C.-G., Calmette finds that, although no tubercles are formed, the bacilli remain alive, it may be, for several months. He compares this condition with what we find in syphilitic tissues, in glanders and probably in leprosy. To distinguish from ordinary vaccination, in which we presume that the inoculated bacteria are rapidly destroyed, Calmette terms this particular form *premunition*. This long continuance within the tissues, without of necessity setting up active lesions, is not unlike what we find in syphilis. There the spirochætes may be present for years without causing gummata, and there also, so long as living spirochætes are in the system, the bearer is immune against reinfection with the disease.

If, therefore, argued Calmette, the human being or animal already infected with a mild or benign type of tuberculosis, such as lupus or caseous lymph glands, is protected against reinfection, though not protected against the possibility of the disease lighting up again from the existing foci, should the general resistance be greatly lowered, a yet more attenuated strain of bacilli may have the same protective effects without danger of subsequent lighting up of the active typical disease. And if the protection only lasts so long as the bacilli remain alive within the tissues, it can be maintained by reinoculation.

Results of the B. C.-G. Treatment.

And next he proceeded to test if this were so. He found that whereas rabbits 4 to 5 lb. in weight when inoculated with 1/1000 mg. of a culture of typical bovine tubercle bacilli died from the disease in 50 to 65 days, similar animals showed no tuberculosis when similarly inoculated, if, previously, they had been given intravenously a dose of 25 to 30 mg. of a culture of B. C.-G. made into an emulsion. And in young rabbits 15 to 20 days old a similar protection could be conferred by feeding B. C.-G. by the mouth—five to ten doses of 20 mg. of B. C.-G. repeated five to ten times. And the protection so conferred lasted at least six months. There is abundant evidence that in the newly born, bacilli pass with ease through the gastric and intestinal mucous membrane into the system.

Coming nearer to man, Wilbert, one of Calmette's collaborators, made an extensive test in French Guinea upon 15 chimpanzees and 59 pithecus monkeys. He found that inoculation or ingestion of up to 100 mg. of B. C.-G. cultures were equally without harmful effect in both species; at most there was some slight and temporary swelling of the lymph glands. The premunition conferred by suitable doses lasted at least a year; it could be continued by a repetition of the inoculations or ingestions at the end of the year, and animals so treated could live in habitual contact with other chimpanzees and monkeys infected with open tuberculosis without showing a sign of the disease. After two years of such cohabitation the animals remain uninfected. The method has been tested extensively upon cattle since September, 1924. Up to Jan. 1st, 1926, over 3000 calves had been inoculated in France, Germany, Holland, and Belgium.

The features of the treatment have been as follows. New-born calves, and new-born calves only, have been treated by a single inoculation into the loose tissue of the dewlap of 50 to 100 mg. of B. C.-G., the inoculation being repeated at the end of 12 months. Thus far not a single case has been reported of harmful effects. It must, however, be borne in mind that animals so treated are apt to give the tuberculin reaction. On the other hand, it is evident that here is provided a means whereby in a country whose cattle are heavily infected with tuberculosis, without changing the usual methods of dealing with the cattle or of bringing up the calves, tuberculosis may be eradicated from herds. All that is necessary is to vaccinate the calves with B. C.-G. during the first 15 days of their existence, and to revaccinate them in a year's time.

And now let us turn to man. It was Behring, if I mistake not, who first laid down emphatically that infection with tuberculosis in most cases dates from early childhood. This view Calmette espouses, and he gives striking figures. Combining the figures

yielded by Paris, Vienna, Dresden, Breslau, Prague, and Stockholm, he shows that on the average 19·8 out of every 100 deaths of infants under 12 months old are from tuberculosis. After one year the mortality from this cause rapidly decreases. Thus in Prussia, for every 10,000 of the population the tuberculosis mortality is 24·92 for the first year, 17·01 for the second year of life, and 4·0 for the ages 5 to 15. A return made by the tuberculosis dispensaries in 80 French departments gives corresponding figures. 1362 tuberculous women were found to have given birth in 1922 to 1364 children (two had twins). Of these 1364 children, 327 were stated to have died of tuberculosis in their first year, or 24 per cent. The figures for Paris alone give the yet higher figure of 32·6 per cent. In Belgium, in the dispensaries of the National League, despite the attentions of the visiting nurses of the League, among the infants of tuberculous mothers, brought up by those mothers, the mortality in the first year is 20 per cent. These continental figures, it must be admitted, are greatly in excess of those of most British cities. In Liverpool, for example, in the last year of which we have record —1924—of 2113 deaths under one year only 34 were from tuberculous disease, or 1·6 in place of Calmette's 19·8 per cent. Still, it must be remembered that Calmette's figures are culled from tuberculosis dispensaries and other institutions which deal mainly with children of tuberculous parentage, and as Lissant Cox and MacNalty have pointed out, in one London tuberculosis dispensary the tuberculosis mortality among the children under 1 year was 22 per cent.

Since 1921, when Dr. Wall-Hallé began the work upon infants born in the maternity department of the Charité Hospital in Paris, the use of B. C.-G. for the vaccination of the new born has rapidly developed. In 1922, 217 new born were subjected to a course of these preventive ingestions of 1 cg. of B. C.-G. cultures. From July 1st, 1924, to Jan. 1st, 1926, 5182 infants were similarly vaccinated by the mouth in Paris and throughout France. Of these 5000 odd, 1317 have been individually reported upon for periods varying from 6 to 18 months. Of these 1317, there were 564 with premunition extending from a year to 18 months, 753 with premunition extending from six months to one year.

Take first the 564 cases of longer continuance. Only two died of presumed tuberculosis, 43 of disease of other nature, and this despite the fact that 231 were reared in contact with tuberculous parents or others suffering from the disease.

Of the 753 of shorter continuance, nine died of presumed tuberculosis, 53 from other conditions. Even if all the deaths had been from tuberculosis, the percentage mortality would have been only 8·2 instead of the usual Parisian percentage of 20 and more, and this although no less than 355 had been raised in habitual contact with infected persons. If we add together all the cases, out of 1317 infants vaccinated six months and more, only 0·7 per cent. had died of conditions diagnosed as tuberculous. I would ask you to compare this figure with the minimum mortality of 25 per cent. recorded for the tuberculosis dispensaries of France in general and the 32·6 per cent. of Paris.

Here, obviously, is a magnificent advance. As regards the few deaths from tuberculosis of infants subjected to this method of vaccination by the mouth, or premunition, it must be recalled that the existence is admitted of a small proportion of infants infected in utero. Further, it may well happen in the circumstances that another small proportion of infants become subject to massive infection by the human tubercle bacilli before the premunition becomes effective.

Possibly, I owe an apology for entering into such full detail regarding methods and results already well known to many of my audience. Occupied as I am with university administration, I acknowledge and bewail the fact that it is not possible for me to keep up my reading in all branches of medicine. At most I have been able to read regularly THE LANCET and the *British Medical Journal*. Thus I may easily have overlooked a wide British literature upon Calmette's work. Yet what has impressed me has been that in the above-mentioned organs in which matters of foremost interest to the profession are discussed, there has been altogether inadequate recognition of what I regard as the greatest and most notable advance in the arrest of tuberculosis accomplished in our generation. It is true that it is preventive and not curative. But it is the culmination of a series of investigations by one man and his collaborators carried on steadily since 1906. It is an admirable example of my to-day's thesis regarding advance in general—namely, that for long years work of the first order may be pursued, which for all those long years may well seem to the outside world, and even to our profession, to be purely academic, and devoid of interest save to the man of science, but which nevertheless leads eventually to some simple generalisation capable of confirmation the world over, not by the expert alone, but by the ordinary practitioner, which then at a bound becomes the guiding principle of a new era.

For if this principle of Calmette be grasped, then we see before us a simple means of eradicating both human and bovine tuberculosis. To give a dose by the mouth of an emulsion of B.C.G., to the newly born infant, and again to the child of 1 year and of 2, sets up no disturbance but carries that child over the period of most frequent infection with the active disease. The same is true of the calf. We still have to learn how far the premunition confers a more and more lasting immunity the more often it is repeated, to learn whether it resembles ordinary vaccination in this respect. This, however, appears to be indicated most definitely, that all children born into tuberculous households should be given this treatment. And it may well be that this should become the routine treatment for all children, as much a routine as vaccination proper.

HOUR-GLASS STOMACH:

THE OPERATION OF CHOICE.

BY SETON PRINGLE, F.R.C.S. IREL.,
SURGEON TO THE ROYAL CITY OF DUBLIN HOSPITAL.

THE surgery of the stomach presents no more interesting problem than the treatment of hour-glass contraction; the conditions found at operation are so various that no one method can meet all cases, and often the judgment and ingenuity of the surgeon are taxed to the utmost.

I have employed many different procedures, and in many cases have had the results controlled by post-operative X ray examinations. Some methods I have discarded as unsatisfactory; others I have found successful in varying degrees, and so have gradually formed a fairly definite opinion as to their relative merits. Perhaps it may be of service and interest to others to follow the steps by which I arrived at this opinion, and to enable them to do so I will quote some cases illustrative of the methods employed, with in most cases pre- and post-operative X ray photographs.

Diagnosis of Hour-Glass Stomach.

Before doing so I would like to refer shortly to the diagnosis of the condition. About 80 per cent. of the cases occur in females and all, without exception, give a history of gastric trouble extending over many years. Most cases present the symptoms of pyloric obstruction, with or without the addition of active ulceration. Vomiting is the most marked and constant feature; the vomiting is, however, not usually of such a large quantity, and occurs at more frequent intervals than in pyloric stenosis. Pain comes on at varying intervals, from a few minutes to perhaps an hour after food, and is relieved by vomiting. As a rule there is nothing

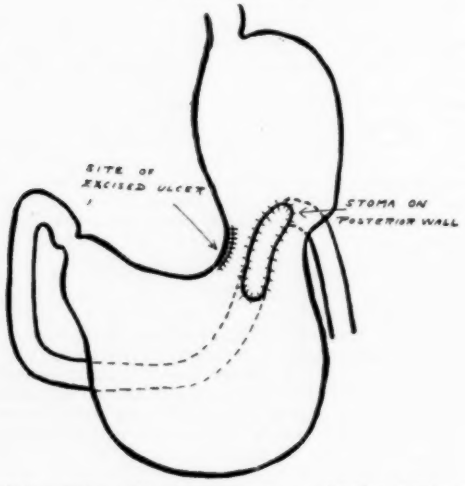
characteristic in the nature of the pain, but a few of my patients complained of a "squeezing" or "griping" pain in the left hypochondrium, and I consider that pain of this character is of value in suggesting a diagnosis.

Physical examination as a rule helps but little, but the failure to discover a dilated stomach in a suspected case of pyloric stenosis should arouse suspicion. The diagnosis really rests on the result of the X ray examination after a barium meal, and in this connexion there are two points to which I should like to call attention. First, there is frequently found a marked six-hour residue in the distal sac, even when there is no pyloric or duodenal obstruction, and this I take to be partly due to the delay in the delivery of the meal through the constriction, and partly to the fibrous ring of the constriction interfering with the normal peristalsis of the stomach. In the second place, the X ray plate, when taken with the patient standing up, invariably shows the constriction lying at a much lower level—and hence more accessible—than is found to be the case at the subsequent operation. The stricture also appears to be longer and narrower than is actually found with the patient lying on the operating table with the stomach empty. I believe that the weight of the barium distorts these stomachs, which are often atonic, and thus the plate taken with the patient in the erect position tends to give an exaggerated and somewhat misleading picture of the actual condition present.

Methods Employed: Illustrative Cases.

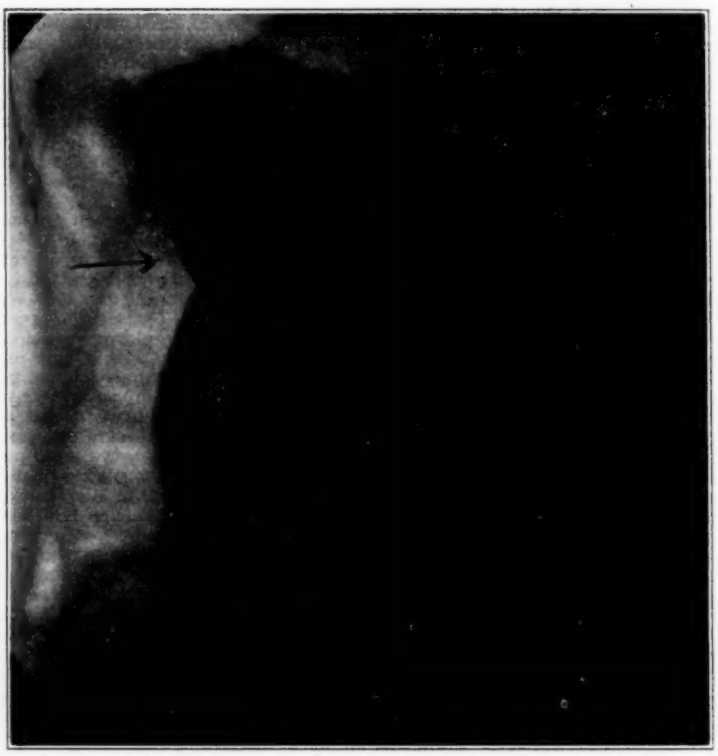
CASE 1. *Posterior gastro-enterostomy across the constriction and extending into both sacs with excision of ulcer.*—J. M., aged 38. Fifteen years' history of pain after food and vomiting. X ray: Well-marked constriction at junction of upper and middle thirds; ulcer crater on lesser curvature; constriction probably partly spasmodic. Operative findings: Active ulcer on lesser curvature; scars of several healed ulcers on posterior wall at same level; marked hour-glass constriction with very large distal sac; no pyloric stenosis. Operation: Cautery excision of ulcer; posterior gastro-enterostomy across constriction, the stoma extending into both sacs (Fig. 1). Remark: An attempt to provide an outlet from both sacs by means of one large stoma, instead of by a separate stoma into each sac. Result: Patient relieved of pain but suffered from discomfort and vomited occasionally. Post-operative X ray: No evidence of con-

FIG. 1 (Case 1).



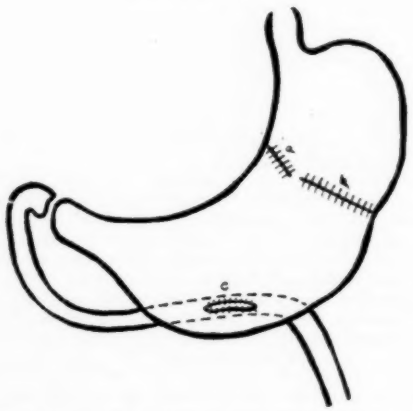
Posterior gastro-enterostomy across constriction, followed by marked retention of food in dilated distal portion of stomach.

FIG. 2 (Case 2).



Post-operative X ray. Four weeks after a gastro-gastrostomy by adaptation of Finney's gastro-duodenostomy. Note persistence of constriction.

FIG. 3 (Case 3).



Diagrammatic representation of condition at conclusion of operation showing (*a*) site of excised ulcer, (*b*) suture line after Finney's operation on constriction, (*c*) posterior gastro-enterostomy into distal sac.

striction; barium passing rapidly through stoma; large six-hour residue in part of stomach corresponding to distal sac. Note: Apparently a considerable portion of the food passed over the highly placed stoma into the dilated atonic

FIG. 4 (Case 4).

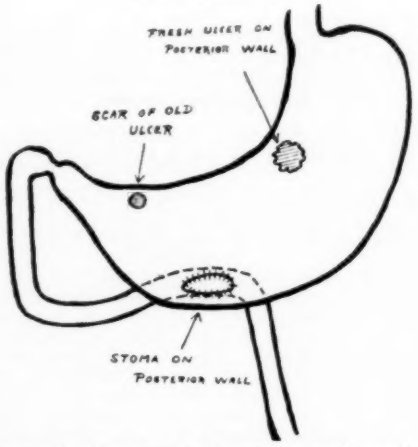


Diagram to show condition found at second operation.

FIG. 5 (Case 4).

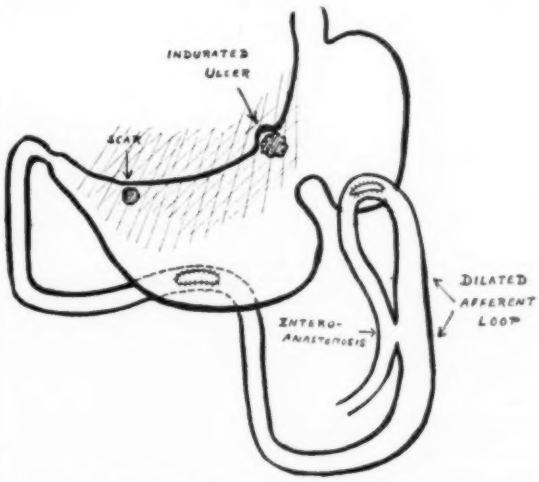


Diagram of final condition showing anterior gastro-enterostomy into proximal sac and entero-anastomosis.

distal portion of the stomach and marked delay occurred there, even in the absence of pyloric stenosis, giving rise to persistent discomfort and occasional vomiting. The result in a similar case in which the same operation was performed was also unsatisfactory and, consequently, the method was discarded.

CASE 2. *Finney's pyloroplasty on constriction with excision of ulcer.*—Mrs. S., aged 45. History of many years trouble. X ray: Ulcer demonstrated high up in the lesser curvature with very marked constriction. Operation: Ulcer excised and the two sacs united by operation similar to Finney's gastro-duodenostomy. Result: This patient made a very satisfactory recovery, but an X ray four weeks after operation showed well-marked constriction still present (Fig. 2). Unfortunately, she cannot now be traced.

CASE 3. *Finney's pyloroplasty on constriction with excision of ulcer and gastro-enterostomy.*—Miss N., aged 52. History: Extending over 30 years. X ray: Very marked constriction demonstrated high up in stomach, with marked retention in both sacs. Operation: Ulcer at site of constriction excised and the two sacs united by the method of Finney's gastro-duodenostomy; posterior gastro-enterostomy into the large lower sac as stricture of the pylorus was also present (Fig. 3). Result: Symptoms were quite relieved and have remained so up to the time of her last visit some nine months later, although an X ray at that time showed a considerable amount of constriction, with the stoma from the distal sac functioning normally. Note: The *immediate* post-operative appearances in this and in Case 2 were excellent, the stomach appearing normal in shape and contour, but subsequent examination in these two cases demonstrated the liability to recurrence and, therefore, I have discarded this method also.

CASE 4. *Anterior gastro-enterostomy into upper sac combined with entero-anastomosis at a later date.*—Miss G., aged 28. First operation: In 1914 I excised an ulcer in the anterior

FIG. 6 (Case 6).

X ray 18 months after operation. Rapid emptying of barium through anastomosis of proximal sac to the duodenum after a partial gastrectomy.

wall near the pylorus and did a posterior gastro-enterostomy. Patient returned in 1921 with recurrence of symptoms. As teeth were very foul these were extracted and the abdomen opened a month later. Second operation: I found an indurated ulcer the size of half-a-crown on the posterior wall of the stomach, *above* the site of the gastro-enterostomy and densely adherent to the pancreas (Fig. 4). I carried out a transgastric excision of the ulcer. Result: Patient had complete relief for almost a year. Symptoms then recurred and an X ray showed a well-marked constriction in the pars media with the stoma from the distal sac functioning normally. Third operation: At the subsequent operation I found the pyloric half of the stomach buried in dense adhesions, in the centre of which an indurated ulcer could be felt. An anterior antecolic gastro-enterostomy with a long loop was performed into the upper sac. Following this she had relief from pain but vomited at frequent intervals. An X ray six weeks later showed the food passing through this new stoma into a greatly distended coil of the small intestine, which the radiologist considered to be the efferent loop. Fourth operation: On opening the abdomen for the fourth time I found that the *afferent* loop of the anterior anastomosis was greatly dilated and hypertrophied. Anastomosis was then performed between the afferent and efferent loops, and this provided complete relief (Fig. 5). Note: The occurrence in this case of fresh ulceration above the site of a functioning gastro-enterostomy is of interest.

CASE 5. *Posterior gastro-enterostomy into proximal sac.*—Miss A., aged 50. History: Perforated gastric ulcer 22 years ago; two operations in interval by other surgeons—namely, resection of the hour-glass constriction, and division of adhesions, both of which operations relieved for several years; recurrence of symptoms for past year. X ray: Well-marked cicatricial hour-glass with a considerable six-hour retention in both proximal and distal sacs. Operation: Pyloric half of stomach buried in dense adhesions, among which could be felt an indurated ulcer adherent to liver; no attempt made to separate; posterior gastro-enterostomy into upper sac. Result (18 months later): No discomfort, pain, or vomiting; has put on weight. X ray: Proximal sac empties rapidly through stoma—distal sac not demonstrated.

CASE 6. *Excision of distal sac.*—Miss H., aged 38. History: Gastric trouble for seven years. X ray: Marked constriction in mobile ptotic stomach. Operation: Excision of distal sac with anastomosis of stomach to stump of duodenum—i.e., partial gastrectomy by method of Bilroth 1. Result (18 months later): Patient reported herself as being "splendid and able to eat anything." X ray: Stomach emptying rapidly through new opening (Fig. 6). Note: In other cases the remaining portion of stomach has been anastomosed to jejunum—i.e., partial gastrectomy after method of Polya 2, and in all cases immediate and after-results have been excellent.

Unsatisfactory Methods of Treatment.

It will be noted that I have not made use of two methods which have been advocated for the treatment of hour-glass stomach—excision of the stricture with resulting end-to-end anastomosis—i.e., the so-called "sleeve" resection, or the method of gastro-gastrostomy by simple anastomsis between the two sacs. With regard to the first, the results as reported by other surgeons are not sufficiently satisfactory to encourage me to try it on any of my earlier cases and, later on, it seemed to me that the cases on which it could be employed were just those in which partial gastrectomy was indicated, and that, while the operation was quite as severe, the results were less likely to be satisfactory. One of the cases reported above (Case 5) had already had a sleeve resection done by another surgeon. As regards simple gastro-gastrostomy, I considered that the adaptation of Finney's pyloroplasty to the constriction gave a better anatomical and mechanical result, and since the latter has proved unsatisfactory, I saw no reason to hope that the former would be more successful.

Conclusions.

The conclusions at which I have arrived as the result of my experience controlled by X rays are: 1. Partial gastrectomy is the operation of choice whenever possible, and the percentage of cases in which it is possible rapidly increases with experience. 2. When gastrectomy is not feasible owing to adhesions around the distal sac, or to the high position and small size of the upper sac, I believe a posterior gastro-enterostomy into the upper sac is the best procedure. 3. When the distal sac is large or obstruction of the pylorus or duodenum also exists, a second stoma should be provided from the distal sac into the same or another loop of jejunum. In cases of difficulty I have no hesitation in performing an anterior gastro-enterostomy with, or without, an entero-anastomosis. 4. I regard as unsatisfactory all direct attacks on the constriction either by means of a single gastro-enterostomy across the constriction (the opening extending into both sacs) or by any plastic operation such as Finney described for stricture of the pylorus.

A NOTE ON THE CAUSATION OF GYNÆCOMASTIA (MAMMARY FEMINISM).

BY F. PARKES WEBER, M.D. CAMB., F.R.C.P. LOND.,
PHYSICIAN TO THE GERMAN HOSPITAL, LONDON.

GYNÆCOMASTIA—or as one might term it, "mammary feminism"—is the condition of enlargement of the breast in a male causing the organ in question to appear like that of a female; this condition may be bilateral or unilateral. The *bilateral* form may, in some cases, be "primary" or "essential"—that is to say, really of unknown developmental causation; in fact, it may be a localised "mammary form of feminism," unaccompanied by any other signs of feminism; but in other cases (usually accompanied by various obvious bodily, and possibly psychical, signs of feminism) it is definitely of endocrine origin, and secondary to deficiency of the testicular interstitial gland. Castration may be a cause of gynæcomastia, if performed during the period of early sexual activity; or the deficiency of the interstitial gland may be due to congenital or acquired disease, such as, for instance, testicular atrophy caused by the orchitis of mumps. It can hardly be caused by gonorrhœal or tuberculous epididymitis, because in such cases the interstitial gland of the body of the testis is not destroyed. It need not invariably accompany conditions of male sterility, for the seminal functions of the testis may be destroyed without destruction of the interstitial gland. If the testes are excised, destroyed, or injured some years after the establishment of puberty, gynæcomastia may be the only (or at least the chief) result in regard to alteration in secondary sexual characters. So far I am in accordance with the conclusions of J. Decléty and others (see below).

The occurrence of *unilateral* gynæcomastia can obviously not be explained in the same way any more than could unilateral acromegaly (if, as has been claimed, there really were such a condition)[1] be attributed to an endocrine disturbance of pituitary (hypophyseal) origin. Certain cases of unilateral gynæcomastia have followed injury to the testis of the same (or still more rarely of the opposite) side,[2] and Decléty[3] points out that in such cases the injury to the testis was received during the period of full sexual development, not before the onset of puberty. Decléty believes that the cases in question can be explained on the supposition that in males the normally active testis, apart from its hormonic (endocrine) effects, exercises a reflex nervous inhibitory action on the growth of the breast, which would otherwise in normal males about the period of puberty tend to develop as the female breast does under the influence of the hormones of puberty; a traumatism, even of slight degree, to one testis may, he suggests, remove this inhibitory action.

Here I would also refer to Condomine's case[4] in which *bilateral* gynæcomastia followed severe injury to *both* testes in a young soldier aged 21 years.

Decléty[5] goes even so far as to suggest that cases of unilateral gynæcomastia are *always* due to a congenital or acquired testicular lesion, especially a testicular traumatism (usually of the same side as the gynæcomastia, rarely of the opposite side). It seems difficult to accept this conclusion in view of the cases of unilateral gynæcomastia that have been published by various observers without reference to any lesion or traumatism to either testis.

The accompanying portrait (see figure) is that of a man, aged 34 years, whom I saw in 1898, with unilateral gynæcomastia of the right side. I saw him again in 1904, on account of some bronchitic trouble, and I noted that the right mamma felt as if it contained genuine gland tissue. As far as I remember, he told me nothing of any testicular injury.

It is likewise not easy to apply Decléty's views to the rare examples of mammary enlargement in men following the operation of prostatectomy. Two such cases were recorded by E. Kondoleon [6] in 1920, both in men aged 70 years. In one case the enlargement was unilateral; the right breast began to swell soon after the operation, attaining the size of a walnut, but after a few months the swelling gradually subsided. In the second case the enlargement was bilateral, commencing on the left side about three months after the operation. The progress in the second case is not recorded, as the operation was recent at the time when the paper was published.

I should here like to allude to a very rare and almost acute kind of bilateral gynæcomastia occurring in young men as a pathological endocrine (hormonic) result of a primary adeno-carcinomatous growth of the suprarenal cortex. The first case was shown me in November, 1915, by my then surgical colleague, Dr. J. P. zum Busch, and I have his permission to describe it.[7]

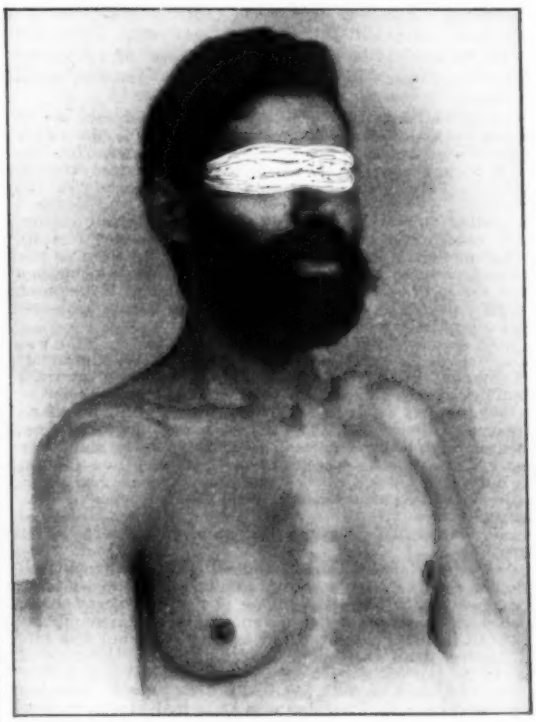
The patient was a male cook, aged 27 years, admitted to hospital on Nov. 9th, 1915. For the last two months he had noticed painless enlargement of both mammæ, and he could squeeze a few drops of a slightly milky fluid from the nipple of each breast. For the last three weeks there had been also considerable (rather soft) swelling of the lymphatic glands on the left side of the neck. The man died on Dec. 2nd, 1915, and post-mortem examination (Dr. Hans Schmidt) showed an extensive malignant hypernephroma growing from the cortex of the left adrenal gland, with great numbers of metastatic growths in the lungs. There were some secondary nodules attached to the ribs and vertebral column, seen on clearing out the contents of the thorax; the mesenteric glands were also involved. The enlarged lymphatic glands on the left side of the neck had already, in November, been found (by operation) to contain a very vascular new growth. Microscopic sections from one of the enlarged mammæ showed glandular tissue resembling that of an ordinary mamma in the female. In this case it seems that a hormone-like substance derived from the actively growing cells of the adrenal cortical adeno-carcinoma had stimulated the male mamma to take on an active secreting function, normal to the female mamma. Prof. S. G. Shattock also kindly examined the sections in this case.

Though this observation appears at present to be almost unique, I feel confident that sooner or later it will be confirmed by many similar ones. It may be compared to the remarkable Bittorf-Mathias case, as finally described by Prof. E. Mathias,[8] who made the post-mortem examination in July, 1919.

The patient was a man, aged 26 years, who had suffered from dyspnœa since March, 1918. In August, 1918, a progressive enlargement of the mammæ was noticed and a few months later the testes commenced to atrophy. In February, 1919, the patient became sexually impotent, and in March, 1919, a tumour in the left part of the abdomen was observed. The patient developed metastatic tumours in the liver and signs of compression of the inferior vena cava. He died in July, 1919. The necropsy showed that the case was one of malignant cortical hypernephroma. Both mammæ, which had somewhat diminished in size before the man's death, consisted of loose connective tissue containing true mammary glandular tissue. The testes were extremely small; microscopically, there was evidence of spermatogenesis; the insterstitial cells were hardly developed.

It would be interesting to know whether enlargement and activity of the male mammæ is ever associated with (benignant) adrenal cortical adenoma, as it evidently may be with (malignant) adeno-carcinoma, and whether any cases of ordinary chronic bilateral gynæcomastia in man are associated with adrenal cortical adenoma.

A point of great interest in Dr. zum Busch's case and in the Bittorf-Mathias case (which absolutely confirm each other) lies in the fact that in both of them a kind of rapidly developed "mammary feminism" or gynæcomastia was associated with a malignant cortical hypernephroma of the suprarenal gland—that is to say, that in both cases the "mammary feminism" developed as a *morphogenic*, endocrine, or hormonic result of functional activity in the carcinomatous cells of adrenal cortical parentage. I need scarcely add that it is well recognised that adeno-carcinomatous growths may sometimes more or less retain the functional, as well as the morphological, characters of the normal glandular cells from



Unilateral (right) gynæcomastia in a man aged 34 years.

which they are derived (compare the well-known presence of a bile-like substance in primary carcinomata arising in cirrhotic livers). But the morphogenic effect of the growth in the above cases (the two young men) was very different to the previously recorded morphogenic effects of primary adenoma or adeno-carcinoma of the suprarenal cortex in children and young women.[9]

I should here also mention that true bilateral hypertrophy of the breasts in males due to hormonic (endocrine) stimulation has been noted in certain rare cases of teratoma testis and its metastases. Prof. H. W. B. Cairns included two such cases in his recent Hunterian lecture on Neoplasms of the Testis,[10] and he referred to other cases (one each) observed by E. Garbarini, J. V. Cooke, Warthin, and A. Malloch. In three of the cases (those of Cooke, Warthin, and Malloch) chorion-carcinoma was present in the testicle. Cairns remarked that the cases in question provided "indirect evidence in support of E. Starling's original contention [11] that the normal fœtus produces a hormone which acts directly upon the breasts."

References.

1. Cf. Lacaille: "Trois cas d'acromégalie paraissant unilatérale," Société de Médecine de Paris, meeting of April 10th, 1914. The existence of such cases may be denied, but why should not a unilateral response to some general hormonic stimulation occur in very exceptional cases? Can one not conceive the possibility of what one might call a "potential hemi-hypertrophy" being present, ready to be converted into actual unilateral hypertrophy or gigantism by hormonic stimulation? Moreover, in thyreotoxism or hyperthyroidism (that is to say, in Graves's disease) the exophthalmos is occasionally unilateral or more marked on one side than the other (F. P. W.).

(*References continued at foot of next page.*)

Clinical and Laboratory Notes.

A CASE OF RECURRENT INTUSSUSCEPTION.

BY PHILIP R. HAWE, M.B., CH.B. LIVERP.,
SURGICAL ASSISTANT, DAVID LEWIS NORTHERN HOSPITAL, LIVERPOOL.

THE following is a record of a case of recurrent intussusception which occurred in a female, aged 40 years:—

The patient complained of several attacks of very severe pain in the abdomen, associated with a palpable lump deep to the abdominal wall. Up to three months ago, when the attacks commenced, she had had no abdominal trouble whatever. The pain commenced just to the left of the umbilicus. At first typically colicky in nature and localised in distribution it became a more general agonising cramp, which caused the patient to sweat, and doubled her up, leaving her quite exhausted. She applied pressure to the part and found a tender lump about the size of an orange which varied in consistency, becoming harder with the onset of each pain. The lump was palpable as a rule for some hours after the attack had subsided.

These accounts were confirmed by her doctor, who was called to see her several times, and also by Mr. K.W. Monsarrat. The attacks lasted from one to eight hours, and occurred about three times a week. They may have had some relation to the taking of food, as occasionally they commenced an hour or so after a meal. The intervals were not quite free, as a dragging pain was present continually in the right iliac fossa. There was no history of melæna, and constipation was only occasional. Borborygmi and flatulence had, since the onset of these attacks, been usual after all types of food. History relating to urinary and other systems appeared normal. Some loss of weight had occurred since the onset of the illness.

After admission to hospital several abdominal examinations were made with varying results. On one occasion a mass was palpated in the region of the transverse colon, which slowly became smaller and smaller on gentle manipulation until it disappeared. At its largest the lump was soft and tender, somewhat elongated, and about the size of a closed fist; it did not pit on pressure, nor was it definitely mobile, but, as described, gradually disappeared. Further examination revealed nothing else abnormal except tenderness in the right iliac fossa. There was no visible peristalsis, and examination of rectum, urine, fæces, and also an X ray examination gave negative results. As a rule, during the intervals no lump was present.

As the lump had been palpated quite definitely on several occasions, even after enemata had been administered, operation was undertaken. On opening the peritoneal cavity the transverse colon presented, and the nature of the lesion was immediately evident. An intussusception of the colocolic type was present and was reduced without the least difficulty. The apex of the intussusception, which had reached the middle of the transverse colon, was formed by the wall of the cæcum with the opening of the appendix as centre. There were no adhesions between the layers of the intussusception, but the apex formed a mass which was circular in shape, very thickened and œdematous, and about the size of a five-shilling piece. The appendix was adherent to the posterior surface of the cæcum and extended towards the hepatic flexure behind the ascending colon, to which it was also bound. It had evidently been secondarily invaginated, base first, with the rest of the cæcum into the colon as the intussusception progressed. Appendicectomy was then performed. In view of the induration of the cæcum round the base of the appendix, it was thought better to excise this part of the cæcal wall. No evidence of new growth or cause for the intussusception could be found, with the exception of an excessively mobile cæcum and ascending colon. Accordingly, after closure the cæcum was fixed to the iliac peritoneum to prevent any possibility of recurrence. From the situation of the apex of the intussusception it was obvious that the appendix had not been primarily involved. Subsequent microscopical examination of the excised portion of the cæcum showed œdema with some fibrosis and mild inflammatory reaction, but no sign of new growth.

It is quite clear from the history and the operation findings that the patient had suffered from a series of recurrent intussusceptions with spontaneous reduction after the attacks had lasted some hours. The absence of melæna and of adhesion between the layers of intussusception is to be explained by the failure of interference with the blood-supply of the affected parts. This type of intussusception probably corresponds to the rare type of recurrent intussusception of older children which, in contrast to the intussusception of infants, rarely, if ever, gives rise to acute complications. Some irregularity of peristalsis seems to be the only explanation of its occurrence. As is well known, some form of neoplasm usually originates intussusception in adults. In this case, however, when the intussusception had once occurred the œdematous apex predisposed to a recurrence. Some of the attacks had been related to the taking of food, the pain having been felt about an hour after meals. Probably the gastrocolic reflex had occurred as usual, followed by active cæcal movements, and after some time the intussusception had reached dimensions sufficient to give rise to severe symptoms.

My thanks are due to Mr. Monsarrat for his permission to publish this case.

(*References continued from previous page.*)

2. E. Apert and J. Decléty: "Gynécomastie unilatérale à la suite de traumatisme des bourses," Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris, third series, 1918, xlii., 1091–95. Other cases are cited in J. Decléty's Thèse de Paris, 1919, No. 193. There is, however, some mistake in regard to Cockayne's case, cited by Decléty as having been published in the Proceedings of the Royal Society of Medicine for 1914. Dr. E. A. Cockayne informs me that he never published such a case.
3. J. Decléty: Loc. cit. (Thèse de Paris, 1919 No. 193).
4. Condomine: Abstract in Presse Médicale, Paris, 1920, xxviii., 850, from the Montpellier Médical of Nov. 1st, 1920. I have not seen the original paper.
5. Decléty: Op. cit., p. 40.
6. E. Kondoleon: "Vergrösserung der Brustdrüse nach Prostatektomie," Zentralblatt für Chirurgie, Leipzig, 1920, xlvii., 1098.
7. Cf. F. Parkes Weber: British Journal of Dermatology and Syphilis, London, 1926, xxxviii., 7–8.
8. A. Bittorf: "Nebennierentumor und Geschlechtsdrüsenausfall beim Manne," Berl. klin. Wochenschr., 1919, lvi., 776; E. Mathias: Virchow's Archiv, Berlin, 1922, ccxxxvi., 451.
9. Cf. Bulloch and Sequeira: Trans. Path. Soc. Lond., 1905, lxvi., 189; Glynn: Quart. Jour. Med., Oxford, 1912, v., 157; Gordon Holmes: Ibid., 1925, xviii., 143; Sir H. Rolleston: West London Med. Jour., 1925, xxx., 105; E. Mathias: Virchow's Arch., 1922, ccxxxvi., 446; Helmut Schmidt: Ibid., 1924, ccli., 8. All of these give abundant references to the literature.
10. Cairns: THE LANCET, 1926, i., 847.
11. Starling: THE LANCET, 1905, ii., 581.

PNEUMOCOCCAL MENINGITIS: CISTERNAL PUNCTURE.

BY A. H. DOUTHWAITE, M.D., M.R.C.P. LOND.

THE publication in THE LANCET of April 10th by Dr. V. M. Synge of a recovery from pneumococcal meningitis prompts me to put on record the following case which was under my care:—

A girl, aged 15, was first attended on July 25th, 1925, on account of headache. She had suffered for several years from chronic nasal catarrh. Pain in the cranial vertex started two days previously and was attributed to sunstroke following a long char-a-banc ride.

On *examination* no abnormality was found of the cranial nerves, tendon, and skin reflexes. Kernig's sign was absent. The skull was tender to percussion. The decubitus was striking, the girl lying on her side with the head well retracted, a position which was retained when she turned from one side to the other. Temperature 100°F., pulse 120, respiration 20. No other signs.

On the following day Kernig's sign was present, as was also blurring of the right optic disc. Lumbar puncture was performed, and 30 c.cm. of turbid fluid removed. This contained 0·7 per cent. albumin, 1000 cells per c.cm., of which 48 per cent. were polymorphonuclear leucocytes. Cultivation gave a rich growth of pneumococci (not typed). On the 27th head retraction was less marked and the temperature had fallen to 99°. The plantar responses were extensor. Nystagmus present. Every two to three days for the subsequent two weeks profuse epistaxis occurred with transitory relief of headache. The evening temperature rose during this time to 103°. Over the same period three further lumbar punctures were performed and 20 c.cm. of Pasteur antipneumococcic serum introduced intrathecally. On August 9th cisterna magna puncture was carried out

under a general anæsthetic (rendered necessary by head retraction) and 35 c.cm. of turbid fluid containing 800 cells per c.cm. removed; 10 c.cm. of serum were introduced. Head retraction and Kernig's sign were absent on the following four days and the patient became mentally more alert. This process was repeated on the 20th owing to a gradual return of all symptoms except epistaxis. The cerebro-spinal fluid then contained 0·4 per cent. albumin and 57 cells per c.cm. Steady improvement followed and the temperature was normal by Sept. 10th.

When seen again in January, 1926, no abnormal signs could be detected and, with the exception of occasional headaches in the right temporal region, no symptoms could be elicited.

Puncture of the cisterna magna is actually a very simple performance, and appears in some cases to produce greater relief than that procured by the lumbar route. Any serum introduced will, of course, reach the affected areas in greater concentration by the former method.

Worthing.

A CASE OF CCl_4 POISONING

DUE TO THE BURSTING OF A PATENT FIRE EXTINGUISHER.

BY L. A. DINGLEY, M.D. LOND., F.R.C.S. ENG.,

HON. SURGEON, WEST BROMWICH AND DISTRICT HOSPITAL; VISITING SURGEON, HALLAM HOSPITAL.

THE risk of a repetition of the accident described in this article with possibly more serious consequences justifies the reporting of the case, together with a brief summary of the effects produced by inhalation of the chemical in question, especially as a search in the literature has failed to show any cases previously reported.

The patient is a motor-'bus driver. On March 8th he stopped his 'bus, and his attention was called to the fact that a passenger had accidentally knocked down the patent fire extinguisher carried by these vehicles. He climbed down from his seat and, on examination, found it was leaking, and decided, owing to the leakage and bad smell, to do away with the contents. Whilst pulling the handle of the extinguisher out, preparatory to emptying it, the gas and fluid came up into his face. He first noticed burning of his eyes, and rushed into a neighbouring shop where he was advised to put his head into a bucket of water to wash out the fluid. This he did, and then lost consciousness for about 45 minutes.

A policeman on duty near by was called in, and he found the patient propped up in a chair with his head supported by an onlooker. He was quite unconscious, with eyelids closed, which on opening disclosed a fixed and glassy stare, his mouth was closed but easily opened, the pulse was imperceptible, and the mirror test showed that respiration had ceased. With commendable promptitude the policeman commenced artificial respiration by Silvester's method, and carried on for 20 to 25 minutes when the patient commenced to breathe with faint and shallow respirations. He was then given a few ounces of strong tea.

When seen by me he was just regaining consciousness, his eyes were red and injected, he was trying to sit up, and behaving generally like a person coming round from an anæsthetic. His breathing was rather heavy and his pulse 80 and regular. The patient was sent on to the hospital, and on the way the policeman informed me that he again became unconscious but continued to breathe evenly and regularly and his pulse remained slow and full, and he recovered consciousness in a few minutes.

Condition on Admission.—The patient had practically recovered consciousness and showed no physical signs of note. Owing to the difficulty and delay in discovering for certain what the extinguisher contained, and in order to avoid any possible delayed action of the drug on the heart, the patient was kept in bed for two weeks, and then allowed up for a few days. His convalescence was uneventful. Before discharge exercise tolerance tests were carried out and provided quite satisfactory.

The motor omnibus company gave me every assistance and were good enough to reply promptly to my letter, informing me that the chemical used in these extinguishers was carbon tetrachloride (CCl_4), and that it was 99·95 per cent. pure and contained neither acid nor alkali. Carbon tetrachloride is a heavy, colourless liquid with an aromatic odour and boiling at 76·7° C. It is readily vaporised into a colourless vapour 5·33 times heavier than air. This property, together with its non-inflammability, makes it a most valuable agent in shutting out the air from surfaces blanketed by it, thus rendering it most useful in extinguishing fires.

Carbon tetrachloride first claimed the attention of the medical profession in December, 1865, when J. Y. Simpson, of Edinburgh, suggested its use as a general anæsthetic. Its alleged heart depressant properties, however, soon led to its abandonment. Lewin [1] reports that it is about twice as toxic as chloroform. In the early part of the century it was used as a shampoo, but Colman [2] issues a warning, stating that it is dangerous to life; a fatality from similar use has been reported.[3] Carbon tetrachloride is used commercially in the preparation of golf balls, and a case of intoxication has been reported.[4] It is also in use in millinery establishments where a mixture of this chemical with benzol is used as a cement for fixing material to hat shapes. Several cases of non-fatal poisoning were reported by E. B. Starr,[5] but in these cases the symptoms seem to have been mainly due to benzol.

Medically carbon tetrachloride has been recommended as a treatment for hookworm by Hall,[6] but the treatment has been shown by Meyer and Pessoa [7] not to be devoid of danger. The pharmacology of carbon tetrachloride has been worked out in great detail by Lamson and his co-workers [8] at the Johns Hopkins University, and from this work several important facts are made evident. The case under consideration was caused by respiration of the drug, and for full particulars of the effects when taken by the mouth, by injection into veins or intrathecally, and for the pathological findings, reference should be made to the original article. If large doses are inhaled, respiration ceases and the blood pressure falls rapidly, which, in early cases, may be combated by continuous and persistent artficial respiration. It further transpires that alcohol is distinctly dangerous, and should not be given, as it greatly increases the rapidity of absorption and the toxicity of any of the chemical which may have been swallowed.

Treatment.

In cases of escape of this gas, it is important to see that no person, especially if helpless or injured, is allowed to remain on the floor level, owing to the heaviness of the gas. The respiration should be carefully watched, and should be artificially carried out if necessary, and be persevered with for a very considerable time. As a stimulant alcohol should be avoided, resource being made to some watery solution such as strong tea or coffee. Such cardiac stimulants should be used as are used in chloroform poisoning.

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STREET ACCIDENTS IN SHEFFIELD.—At the annual meeting of the Sheffield Royal Hospital it was stated that the hospital deals with 400 street accidents a month, many of them due to the carelessness of pedestrians.

THE Government of Bihar and Orissa has constituted a permanent cadre of public health officers consisting of 27 assistant surgeons. The new cadre is under the Director of Public Health and is distinct from the medical department.

Medical Societies.

ROYAL INSTITUTE OF PUBLIC HEALTH:

ANNUAL CONGRESS, BRISTOL,

MAY 19TH–24TH.

THE Congress, which ended at Bristol on Monday, was attended by more than 300 delegates, a number of whom came from distant parts of the Empire and from foreign countries.

Opening Addresses.

The inaugural meeting was held in the Great Hall of the University. The Lord Mayor of Bristol welcomed the visitors.

The DUKE OF BEAUFORT (High Steward of Bristol, President of the Congress), after referring to the wonderful progress made in the last 50 years, said the bewildering programme prepared for the delegates indicated that hygienists did not intend to rest on their laurels, and expressed his conviction that such congresses must play an important part in shaping public opinion on health matters. Alderman FRANK SHEPPARD (Chairman of the Housing Committee) claimed the great interest now taken in housing conditions as of good augury. The Under Secretary of the Egyptian Health Department voiced the strong desire of the Government of King Fuad to promote the cause of public health both within and without Egypt. The geographical position of Egypt gave her an important share in the defence of humanity from the scourge of disease. The Dean of Bristol expressed the welcome of the churches and his belief that the visitors would find that Bristol was giving a noble lead in caring for those engaged in her industrial activities. Miss TOWNSEND (Chairman, Infant Welfare Association) referred to the enthusiasm of the Bristol women in this work. Dr. C. BENTLEY (Director of Public Health, Bengal) described how cholera and other diseases were being brought under control. Brief speeches were made by representatives from France, Belgium, California, and Australia, and subsequently a reception was given to the delegates by the Council of the University, the guests being received by the Vice-Chancellor and MRS. LOVEDAY.

The work of the Congress was divided among five sections: (1) State Medicine and Municipal Hygiene; (2) Naval, Military, Air, and Tropical Diseases; (3) Industrial Hygiene; (4) Pathology, Bacteriology, and Biochemistry; and (5) Women and the Public Health.

Bovine Tuberculosis.

The problem of improving the milk-supply was opened by Dr. W. G. SAVAGE (M.O.H., Somerset) with a carefully drawn-up criticism of the working of the Tuberculosis Order which should be of great value to the Board of Agriculture. The Order and Regulations read well from the preventive point of view, but do not so work out in practice, says Dr. Savage. So far, in Somersetshire, the manifestly tuberculous cows are being destroyed too late, there is a marked absence of effort to find udder disease at an early stage, there is no systematic examination of the rest of the herd following the discovery of an infectious animal, and little attempt to bring home to the farmer the importance of the matter.

Dr. C. E. TANGYE (M.O.H., Wilts) stressed the importance of regular inspection and said his county council was moving in the direction of a whole-time veterinary inspector. Dr. STENHOUSE WILLIAMS was more optimistic as to the progress being made and suggested that too much must not be expected from the first seven months' operation of the Order. Lieut.-Colonel C. MADDOCK, M.D. (Secretary of the Grade A (tuberculin tested) Milk Producers' Association), described the progress that was being made in the production of this grade of milk and asserted that if herds had been freed of tubercle for a twelvemonth they could, with reasonable precautions, be kept free for many years.

Dr. R. KING BROWN (M.O.H., Bermondsey) described the propagandist methods adopted to promote the sale of this milk in Bermondsey—street corner lectures, distribution of pictorial pamphlets, &c., and mentioned that the borough council had decided to accept only this grade of milk for their hospitals and infant welfare centres.

Surg.-Admiral Sir PERCY BASSETT-SMITH gave an interesting presidential address to the "Services" Section on the relation of diseases of animals to those of man and made special reference to new developments with regard to undulant fever. In France and Spain there was a tendency for this disease to spread inland, and in France the infection was being spread by sheep. In Rhodesia, America, and Italy infection had been traced to cattle and an organism similar to *M. melitensis* had been found in bovines.

Rheumatism.

Dr. A. P. THOMSON (Birmingham) read a paper on the rheumatic child, and Dr. CAREY COOMBS (Bristol) and Dr. M. B. RAY (London) and Dr. R. E. THOMAS (Bath) were amongst the chief contributors to a general discussion on this subject at the Pathological Section. Dr. C. PRESTON BALL (Dublin) dealt with the relation of oral sepsis to rheumatic diseases. Dr. COOMBS stated rheumatism was less frequent than 20 years ago and that there was strong evidence in favour of a causal streptococcus, which might be a normal inhabitant of the intestine converted from a saprophytic to a pathogenic type. Dr. RAY attached importance to diathesis and did not think the results of tonsil enucleation were conclusive. Dr. THOMAS mentioned that the nodules described by Dr. COATES as an early sign were rarely found before the age of 3. He had, however, found them once at the age of 14 months. Their incidence varied in the various schools of Bath and also as between one town and another. Any child with nodules should be kept under careful observation. An excess of carbohydrate in the diet might have a causal effect. From a preventive point of view, perhaps the most important point emerging from the papers and discussion was the need for effective education of both parents and school teachers in the very indefinite early signs of rheumatism, usually with no joint symptoms, so that the children may be treated before irreparable damage is done to the heart.

Racial Progress.

On the second day the women's section discussed the improvement of the race. The problem was attacked from different angles. Dr. INNES PEARCE urged the greater importance of environment and that parents can only provide the right soil for the seed by their own culture and development. Race culture therefore meant parent culture. One must get at the newly-married couples. It was too late to try to break the vicious circle after four or five children had been born. Centres might be used to some extent as family clubs. The present haphazard outlook towards conception and parenthood must be abolished.

Dr. LETITIA FAIRFIELD (P.H. Dept., L.C.C.) reviewed optimistically the present position, after the ten years' campaign against venereal diseases. More and more gonorrhœa in women was receiving adequate treatment. Formerly all sterility was attributed to the woman, but it was now known that at least 25 per cent. of it was due to the man. Syphilis was still the greatest known cause of premature still-births. A positive Wassermann in a newly-born child was often only a "carry-over" from the maternal blood, and did not imply congenital syphilis. Only a very small percentage of the London school-children showed evidence of congenital syphilis. Mental degeneration was very rare and when it did occur was followed by the well-known affections of the special senses. Apart from these rare cases there was no evidence that syphilis in the parents caused mental deficiency in the child. The cures and the continuity of attendance of the cases at the V.D. centres went on increasing and there was a

decline in the deaths attributed to congenital syphilis.

Dr. STELLA CHURCHILL, L.C.C., spoke on the feasibility of health certificates before marriage, and mentioned that such certificates were being encouraged by the German Government.

Mrs. C. S. HODSON (Secretary, Eugenics Education Society) mentioned that the work of the V.D. centres was dysgenic in that it helped the propagation of the immoral and incontinent section of the community. She did not, when questioned, put before the meeting any practical proposals for scientific mating.

Dr. D. S. DAVIES (M.O.H., Bristol), who in an interesting paper read the previous day on Random Recollections of Forty Years' Service, had stressed the enormous importance of heredity and prophesied that race culture would be the task of the coming hygienist, said humanity could not help caring for its weaklings, but that we ought to try to prevent the propagation of the unfit.

The practical suggestions arising from the discussion were early teaching of the facts of life to boys and girls, and the education of both sexes for parenthood.

Cancer.

Dr. J. G. ADAMI (Vice-Chancellor, Univ. of Liverp.), in opening a discussion on cancer at a joint meeting of the State Medicine and Pathology Sections, reviewed the present position and expressed the opinion that, without believing that in colloidal lead Prof. Blair Bell had discovered the ideal substance for arresting cancer, a huge advance had been made. He believed that from now onwards medical research would chiefly concern itself over the provision of better and surer methods of arresting cancerous growths. There were many causes of cancer, and the more hopeful line of attack appeared to be how to end cancer rather than finding out how it began. He did not believe that the campaign of education would lead to "cancer-phobia." The same warning had been thrown out when the campaign against tuberculosis started and had proved ill-founded. He advised every medical man, to whom a patient came with a lump in the breast, &c., not to send them away with comforting words, but to see them again and keep in touch with them, so that surgery, if needed, might be employed successfully.

Commander O. LOCKER-LAMPSON, M.P., speaking as a layman, made a stirring plea for a braver outlook. After three years in Russia, where death was disregarded, it was astonishing to return to this country and find all this fear of death. After all it was better to die of cancer at 52 than from tuberculosis at 22. By getting rid of this fear we should get early operations with a large majority of cures. Recent discoveries indicated remarkable progress. We must therefore, with hopeful confidence, provide adequate support for research work.

Other interesting discussions were those on silicosis, factory hygiene, vocational selection, the care of the crippled child, advance lines in maternity and child welfare, and the health of women industrial workers. The sections were well attended, interest being kept up to the finish, and the Congress fulfilled its purpose of directing public attention to every branch of health work.

A YEAR-BOOK OF LEARNED SOCIETIES.—For the forty-second year in succession the Year-Book of Scientific and Learned Societies has been produced by Charles Griffin and Co., Ltd., of 42, Drury-lane, London, W.C. 2. This book is a guide to the societies and Government institutions of Great Britain and Ireland, and briefly records the work done in literature, science and art during the session 1924–25. There are so many separate organisations that a reference work of this kind is essential, and long experience has enabled this firm of publishers to provide just what is wanted. It is equally attractive to those who have a taste for the desultory acquirement of general knowledge and to those whose work involves hurried reference, and thus it fully justifies the claim to have "helped men to enjoy life or the better to endure it." The price is 15*s.*, and the book contains over 400 clearly printed pages.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ELECTRO-THERAPEUTICS.

A MEETING of this Section was held on May 21st, Dr. ALASTAIR MACGREGOR, the President, occupying the chair.

Dr. H. EATON STEWART (New Haven, U.S.A.) read a paper on

Diathermy in Pneumonia.

The earliest attempts, he said, to use diathermy in pneumonia were made by two Americans, F. De Kraft and Byron S. Price, of New York, about 1906. When Dr. Stewart began to use it in 1921 he was unaware of this previous work. In that year a severe epidemic of the disease occurred in a New York marine hospital, to which he was consultant in physiotherapy, and on the assurance being given that it was reasonably safe, diathermy was allowed to be tried experimentally on a case in which there seemed to be no other chance of recovery. The eleventh day of the illness had been reached, and the man's family had been informed that the case was hopeless. He was given a through-and-through antero-posterior diathermy, with bare composition metal plates, 2000 milliampères, for 20 minutes; the clinical improvement was immediate and marked, and with applications twice daily he made an uninterrupted recovery. In order to make the study of scientific value each case was observed, written up, and checked by the medical staff, X ray and laboratory reports being made by them, and no change being made from the usual medicinal, nursing, and dietetic care. In the next 20 cases treated in this way there was only one fatality—in a patient who was moribund from the start. During the rest of that season every third case was used as a control. Forty-one cases were submitted to diathermy, and the death-rate was 17 per cent.; while 21 control cases, treated similarly except for the diathermy, gave a mortality of 43 per cent. Publication of these results led to an extension of the treatment in both private and hospital practice in the States; Miller, of Prague, seemed the only one who had treated a series in this way in Europe.

Technique.—He used bare, flexible, metal electrodes, covered with a heavy shaving-soap lather, placed directly on the skin antero-posteriorly. For single lobe treatment in the adult the area of the electrodes used was 5 by 7 in.; for two adjacent lobes, 6 by 8 in. There had been a considerable use of German silver chain material, as such electrodes easily conformed to the chest contour. In order to keep the plates warm it was well to have the cords already inserted in the d'Arsonval terminals and the electrodes prepared singly. A folded bath towel could be tucked underneath to ensure good contact. The upper plate was similarly prepared, placed in position, and was usually retained by the spread finger-tips of the operator, who was then able to manipulate the apparatus with his free hand. No weight must be placed on the anterior electrode. Four minutes was the time occupied in raising the current to 1200 to 2000 milliampères, according to the requirement of the case.

With regard to dosage, experience had shown the advantage of giving longer treatments of a lower milliampèrage—i.e., instead of 20-minute applications at 2000 milliampères, 1200 to 1400 m.a. for 30 to 40 minutes was preferred. In very severe cases Dr. Stewart had given 2400 m.a. for an hour at hourly intervals. In private practice severe cases were treated every four hours, omitting early morning application. It seemed to be advantageous to have the cardiac area included in the pathway of the current, as when treating a lower left lobe involvement; this had been confirmed by a number of workers.

Clinical Results.

The clinical results given were based upon over 300 cases. There had been a fall of the temperature by lysis in 97 per cent. of the cases; in many this fall set in on the second or third day. In 1 per cent., in

which there was a deficient power of reaction in the patient, the application was followed by a sharp rise in temperature, then by a fall by lysis and a slowed pulse- and respiration-rate. This doubtless conserved the energy of the body. Another almost invariable result of the treatment had been a lessening of cyanosis when that was present, and this improvement was especially marked when the left lower lobe was involved. Probably it was because the relief from pain permitted of greater respiratory excursion, and also because there was a better intrapulmonic circulation around the area of consolidation. Under the treatment the respiratory rate was lessened by about five per minute, and in most of the cases the respiratory grunt disappeared permanently after the first treatment. The freedom from pain which the treatment conferred allowed the patient to marshal his powers of resistance and this seemed often to have been a determining factor in recovery. Sleep seemed to follow naturally quite early. Extension of the disease occurred under this treatment in about the same proportion of cases as when the treatment was not given. But since electrodes had been introduced sufficiently large to influence adjacent tissue, extension of the disease had occurred in fewer cases. Practically every application was followed by increased perspiration; when this was not too profuse it probably helped the elimination of toxins.

Empyema developed in about two-thirds the number of cases to be expected under other treatment.

Some writers contended that the heat developed in the patient's body by the diathermy was bactericidal, but Dr. Stewart thought that if this were so the disease would terminate as soon as the treatment was started; this did not occur. But the heat which was generated hastened resolution. When, in a few cases, resolution occurred quickly—too quickly—with signs of toxic absorption, the diathermy was at once stopped. It was necessary to speak very guardedly about mortality, for the death-rate from pneumonia varied widely in different epidemics. Dr. Stewart was able to say, however, that in four series of cases, checked by controls, the death-rate had been roughly halved by diathermy. The ascertained grand average death-rate to date was 12·9 per cent., including various seasonal epidemics, and embracing streptococcal pneumonia. No cases were refused the treatment, even if they were moribund. In 42 of the recovered cases the attendant physicians had abandoned hope. There were only two deaths in the whole series in which diathermy was applied before the third day. Favourable comments on the treatment had been made by 90 clinicians who had closely followed the progress of the cases. From every standpoint the treatment appeared to be safe and conservative, but Dr. Stewart studiously avoided the word "cure" in reference to the procedure.

Discussion.

Dr. E. P. CUMBERBATCH said that when he went to the United States last autumn he made a point of asking each clinician he met there—both electrical and medical—what his experience of this treatment was. All thought very highly indeed of it, and he did not encounter anyone who doubted its efficacy. Dr. Stewart's book on the subject was a masterpiece of thoroughness.

Dr. W. J. TURRELL (Oxford) said that from considerations of logic many had felt for some time that diathermy ought to benefit pneumonia, but hospital physicians to whom the method was recommended showed great reluctance to adopt it. One physician to whom he spoke on the subject said he could understand that diathermy might help in some cases of pneumonia, but he did not see how it could help grey hepatisation of the lung. He told that gentleman that the condition was a post-mortem condition. In diathermy the slower one reached the maximum current to be employed the better it was for the patient, but he thought no one would have anticipated from theoretical considerations that 98 per cent. of the cases would terminate by lysis instead of by crisis. But what was lacking in this country was a portable apparatus, so that the electro-therapeutist could go to the homes of patients and give them the treatment there. He asked whether a portable apparatus was in use in America.

Dr. C. B. HEALD said he also could speak of the reluctance of hospital and other practitioners to adopt this treatment. He had treated by the method a case of acute lobar pneumonia, two of delayed resolution, and four of broncho-pneumonia. When his own baby, aged 3, was almost breathless with broncho-pneumonia, the respiration-rate being 52, he fearlessly used the treatment, feeling that it would bring quiet. The effect was remarkable, for long before any appreciable concentration of current was reached there was a definite change in the type of breathing. That had been very noticeable in all his cases which had been treated in this way. One of these was a doctor, aged 36, who had double pneumonia three weeks before diathermy was commenced, and he was sleeping badly and was breathless on exertion. There were few or no signs of resolution. Two heart-shaped electrodes, covered with lint, were used, and as soon as the current was turned on the patient said he felt comfortable, and after the first application he enjoyed a good night. 2000 m.a. caused restlessness, and this patient himself was able to say what strength of current suited him best.

Dr. G. B. BATTEN asked about the comparative values of the open and the closed spark-gap, the latter being the usual form in this country, whereas the United States practitioners seemed to prefer the open form. He also referred to the greatly increased permeability of tissue to current according to the strength used; Phillips, of Belgium, showed that tissue was eight times as permeable to a current of 200,000 as it was to one of half that strength. He did not agree with Dr. Stewart that if diathermy acted as a bactericidal agent it would cure at once; his own view was that it first greatly lowered the microbial activity, then became lethal to the organisms.

Dr. STEWART, in reply, said the profession in the States was fortunate in having several makes of portable instrument for the purpose, giving currents of 75, 110, and 220 volts. They were quite reliable. He averred that the profession in America also took up a conservative attitude in regard to anything new, and he had every respect for the physician who could say he had watched a certain kind of treatment and was not impressed by it, but not for one who objected to it when he had never seen it. He also had noticed there was a change in the type of respiration following the application of the current. In America triple gaps were largely used; some open, some closed, and, except for the noise, he did not think there was much to choose between them. He contended that the lowering of the temperature by lysis at an early stage must effect a great saving of the body resources, for heat was placed there without the body's aid. Among the 143 cases to which diathermy was applied before the third day of the illness, only one died. Good work was now being done at the Crile Clinic to show how electricity could be used to greatly reduce the surgical shock which followed major operations. A very important point about this treatment for pneumonia was its safety.

PURE MILK FOR LIVERPOOL HOSPITALS.—The Liverpool Port Sanitary and Hospitals Committee is endeavouring to improve the quality of the milk-supply to the city hospitals. It reports that although the milk is the best that can be obtained in the district, it is not equal to that produced by the farms visited by the committee in Berkshire. The experience gained in visiting those farms showed that, without any costly buildings, cows can be maintained in thoroughly hygienic premises and their milk produced under extraordinarily clean conditions at very moderate expense. The whole of the milk consumed in the Liverpool hospitals comes from the great dairying district of Cheshire where, the committee thinks, there ought to be little difficulty in keeping tubercle-free cattle. If the Liverpool hospitals were supplied with Grade A Tuberculin-tested milk at present prices the extra cost would be about £1500 per annum.

Reviews and Notices of Books.

HEALTH LEGISLATION.

Public Health Law. By JAMES A. TOBEY, M.S., LL.B., Lecturer on Public Health Law, Massachusetts Institute of Technology, Yale School of Medicine, and Columbia University. Baltimore: Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1926. Pp. 304. 20*s*.

THERE are very few actions taken by a public health official which may not be questioned in court of law. It behoves him, therefore, to walk circumspectly and to bear in mind the risks he is taking, yet not to lack the courage to take risks in case of need. For example, any removal of the environmental disabilities of the people has to be carried out strictly within the letter of the law, which also must be observed punctiliously when any restriction of the freedom of individuals in the health interests of the community has to be enforced. This means that the public health expert has to convince the majority of the people concerned before he can obtain power to apply compulsion to the individual, which is good for both the expert and the public. For these reasons we have a growing volume of literature on public health law, or sanitary law as it is unfortunately called in this country, ranging from the "cram" book for students to the formidable annotated reproduction of Acts of Parliament which gives lengthy and sometimes contradictory legal judgments on debatable points.

This book falls into a category intermediate between the two classes of publication mentioned, and though it deals primarily with American public health law, is of sufficient general interest to be worth study outside the United States. Mr. Tobey commences with a general discussion of public health in its legal aspects, going on to trace the development of American public health law from its sources in the common law inherited from England to the form into which it has been moulded in the various States within the framework of the American constitution. The sanitarian of this country must be impressed on reading the book with the similarity between American law and our own, in spite of the opportunities for divergence afforded by the constitution of the two countries. An interesting feature is the meagre space devoted to the legal problems arising out of the law of nuisances, drains, &c., which occupy so much space in most English manuals of sanitary law, and, on the other hand, the introduction of the subjects of mental and social hygiene. Modern health officers will agree, we think, with the author's view, which has also been frequently stressed by Dr. Charles V. Chapin, who writes a foreword to this book, that the "nuisance" is a greater nuisance to the health departments than it is to the public.

This volume will prove valuable and interesting to public health officials of all nationalities.

Health Legislation. For Students of the Health Services. By Lieut.-Col. F. HARVEY, R.A.M.C. (Ret.), M.R.C.S., L.R.C.P., D.P.H. London: H. K. Lewis and Co. 1926. Pp. 207–x. 8*s*. 6*d*.

Colonel Harvey, who has much experience both of the practice and the teaching of sanitary law, has written a tightly packed summary for the use of health visitors, school nurses, local government and sanitary inspectors, and other social workers. He brings together, in a handy form, a mass of Acts and regulations, and, for the benefit of prospective candidates, adds a few typical questions from recent examination papers. Although the author did not manage to insert a mention of the Dangerous Drugs Act of last August, and although his references to workmen's compensation will require correction in view of the consolidating Act passed before Christmas, the book contains the latest information and explains the Housing Act and the Public Health Act of 1925, and numerous important regulations issued by the Ministry of Health last year. A few minor criticisms may be offered. The table of abbreviations in a much abbreviated book might more conveniently be placed at the beginning than on p. 22. In discussing the departmental transfers of powers under the Ministry of Health Act, reference does not seem to be given to the partial transfer of lunacy and mental deficiency powers from the Home Office in May, 1920. The otherwise excellent historical introduction has an entry "1920. The 'Sir' Loin knighted by Henry VIII.," of which the significance is not made apparent; an entry might perhaps have been better made against the year 1662 to Petty's Observations upon the London Bills of Mortality, which gave us our first vital statistics. Doubtless because of the vigorous compression which governs the book, an occasional sentence reads awkwardly. Thus it is stated on p. 19 that "Statutory Acts are Acts of Parliament which have received sanction of the Crown"—as though some Acts were perhaps non-statutory or did not receive the Royal Assent—and on p. 38 that "The Vaccination Acts, 1867 to 1898 and 1907, include a number of Orders and Regulations made under those Acts," when it is presumably meant that the Acts authorise the making of orders and regulations. These are trivial points, perhaps, and there is a remarkable fund of accurate information in this little book which both students and workers will find helpful.

MEDICINE.

A Text-book of the Practice of Medicine. Second edition. By Various Authors. Edited by FREDERICK W. PRICE, M.D., F.R.S. Edin., Consulting Physician to the Royal Northern Hospital; Physician to the National Hospital for Diseases of the Heart. London: Oxford University Press. Pp. 1864. 35*s*.

IN this edition this popular text-book has been thoroughly revised and brought up to date. Slight alterations in classification have been made, and rickets is no longer classified under deficiency diseases, but under diseases of metabolism. Many articles have been added and others rewritten. Among the additions are articles dealing with the Schick test in diphtheria and the Dick test in scarlet fever and quinidine therapy. The last named gives a clear account of the indications, methods, and dangers of this form of treatment. Of the sections rewritten, that on diabetes mellitus and the treatment of diabetic coma is of outstanding excellence. As in the first edition, among the best sections in the book are those dealing with diseases of the central nervous system. Sections dealing with the mental sequelæ of encephalitis lethargica and paraphrenia have been added, and the accounts of epilepsy, aphasia, and defects of speech, hysteria, neurasthenia, and dystrophia myotonica have been rewritten. The part played by metabolic disorder in the ætiology of epilepsy receives special notice.

The book is well indexed and clearly written. With every advance it becomes more difficult to produce a book dealing with every section in medicine adequately and in sufficient detail to make it of use. The need for a second edition so soon after the publication of this text-book shows that the requirements of both practitioner and student have been met in its pages, and its further success would appear to be assured.

Text-book of Differential Diagnosis of Internal Medicine. By M. MATTHES, M.D., Professor of Medicine, University of Königsberg. Authorised translation of the fourth German edition by I. W. HELD, M.D., and M. H. GROSS, M.D., New York. London: J. and A. Churchill. 1925. Pp. 908. £2 2*s*.

THIS well-illustrated and beautifully-printed volume should appeal to those readers who, being unfamiliar with the German language, are still desirous of studying the German point of view on medical

problems. Prof. Matthes's book is well written, full of interesting facts, and provided with references to quite recent German literature. The translators have done their work well and have added to certain sections, particularly those dealing with circulatory diseases, in such a manner as to increase the general utility of the volume. The book should be a welcome addition to many medical libraries.

APPLIED ENTOMOLOGY.

Insects and Diseases of Man. By CARROLL FOX, M.D., Lecturer on Medical Entomology, Hygienic Laboratory, Washington, D.C. London: H. K. Lewis and Co. 1926. With 92 figures. Pp. 349. 18s.

THE first part of this book gives an account, with diagrammatic drawings and diagnostic keys, of the insects and arachnids which are concerned with the spread of human disease; a few mammals such as rats are also included. Its purpose is to enable anyone to identify the practically important species and give them their proper names; accurate systematics are fundamental to modern parasitology, and this section should be useful. The second part deals with the diseases of man transmitted by insects and is less satisfactory; the ground too is already well covered. We notice that barium carbonate and squill are not mentioned under rat poisons.

CHININUM: SCRIPTIONES COLLECTÆ.

Bureau for Increasing the Use of Quinine. Amsterdam. Pp. 262.

THE preface states that the interest with which their first publication (1923) was received has induced the Bureau to publish this second similar collection of papers. It is inevitable that a volume devoted frankly to increasing the use of quinine should give first place, and most space, to malaria; for its treatment rests on quinine, and there is still a steady demand for quinine in its prophylaxis, individual and mass. The place of honour, and a memorial notice, is given to the late grand old man of malaria, Battista Grassi, of whom an excellent and characteristic portrait appears, and a facsimile MS. reproduction of his contribution on the results obtained in the antimalarial fight in consequence of the discovery of the malaria-carrying anopheles. Quinine, of course, has played a part in this fight. As to his own eight years' antimalarial campaign at Fiumicino, he was sure that every year it produced seven times more than it cost; and on the moral side there was no comparison to be made. Next, facing his own portrait, is Laveran's statement: "Malaria is one of the rare diseases against which we can oppose a truly specific remedy—cinchona." Sir Ronald Ross does not here plead for quinine. Opposite his portrait is his brief and cogent summary of the reality of malaria and its meaning in terms of humanity—it is "the principal and gigantic ally of barbarism"; nothing has proved "so inimical to civilisation as this disease." The work of the Malaria Commission of the League of Nations in various countries is recorded and illustrated in a series of papers, as is the like work against malaria in America and the Dutch East Indies. Other papers deal with various problems of malaria, its quinine therapy and its prevention. The risk of getting one's brains kicked out, by barking too close at the heels of error, is well known, so one must admire all the more Clayton Lane's critical consideration of the treatment of the malarias. Intrinsically it deserves the widest note. The adoption of these methods would save much discomfort to patients, and much quinine, and prevent some malaria. Adam, from Dakar, records a case of congenital malaria. The parasites were found in peripheral blood of the mother during labour, and in the umbilical cord blood, and peripheral blood of infant after birth. Certainly this volume contains much of interest and value for the student of malaria, although the evidence, experimental and epidemiological, for the failure of quinine to prevent malarial infection receives in it no other representation than the passing, self-guarding statements of some of the authors that such failure may, and does, occur at times, and that the drug also sometimes fails to cure. Finally, a further series of papers record apparent beneficial results of quinine therapy in a variety of ailments. Prof. Wenckebach contributes an interesting paper on quinine in diseases of the heart and circulation. He relates that once upon a time he had refused to prescribe quinine on the "scientific" grounds that it "really and finally" paralysed the heart. How thoroughly wrong he was was shown when there came to him a patient, "by chance, or possibly not by chance, a Dutchman," who claimed to have a means of getting rid of his own perpetual cardiac arrhythmia, and proved his claim by coming next day with a regular pulse, confessing that he brought this about by taking a gramme of quinine! With the professor one sees how fit it was that such a bearer of the quinine evangel should have been a Dutchman.

As another agent for increasing the use of quinine this volume could hardly be bettered.

HANDBUCH DER TROPENKRANKHEITEN.

Third edition. Edited by Dr. CARL MENSE, with the assistance of many authorities. Leipzig: Johann Ambrosius Barth. 1926. Vol. IV. Pp. 762. R.M.66.

THIS is a bulky volume which in its size and mass of contents rivals its three immediate predecessors. Written in the same exhaustive manner, illustrated with wealth of detail and ample references to the literature, the new edition of Mense cannot be regarded otherwise than as a book of reference. A section on cosmopolitan diseases of the tropics is contributed by Dr. P. Manteufel. Under this heading one might embrace almost the whole of medicine. He has selected for special mention typhoid, typhoid-like diseases, small-pox and its subvarieties, tuberculosis, venereal diseases, eye diseases, measles and scarlet fever, diphtheria, pneumonia, whooping-cough, influenza, mumps, and skin diseases. The list includes many other morbid conditions as well, and it cannot be said that in his efforts to deal exhaustively with this formidable subject the author has been entirely successful.

The information at the author's disposal has not been in all instances of equal value, and no particular advantage appears to be gained by splitting up typhoid-like diseases and the subvarieties of small-pox ad infinitum. Dr. R. Ruge has written a full account of bacillary dysentery; here again an uncritical attitude is observed in dealing with the innumerable variants of the dysentery organisms which have been described. The historical section, which is of little practical use to the modern student, appears to be unnecessarily laboured. Its writer is responsible also for the section on amœbic dysentery, to which the same criticisms might be applied; the text figures and plates illustrating the pathological appearances of the bowel are, however, excellent. Dr. Juliano Moreira, head of the State asylum of Rio de Janeiro, has written an original article on the psychoses and mental disorders of the tropics, under which are included as ætiological factors syphilis, malaria, sleeping sickness, Chaga's disease, yellow fever, leprosy, plague, encephalitis lethargica, beri-beri, and pellagra. Opium, alcohol, and hashish receive attention as the most potent of cerebral intoxicants in native races. Undoubtedly the best and most exhaustive account of verruga peruviana and Oroya fever that we have is the chapter by Dr. H. da Rocha-Lima; it is illustrated by photographs, temperature charts, and an excellent coloured plate of Barton's bodies in the latter disease. Dr. Georg Sticker writes upon the short fevers of the tropics; these suggest dengue and phlebotomus fever and Weil's disease, but the author ambitiously includes in his net such dubious entities as acclimatisation fever, low fever, and many local "fevers," which for the sake of clarity had better have been omitted. It seems illogical that hepatic amœbiasis and amœbic

infection of other organs should form the subject of a separate chapter and not regarded in direct connexion with amœbic dysentery, from the account of which it is separated by a *bloc* of over 300 pages. This lack of coördination has led to needless reiterations and much waste of space. Dr. U. N. Brahmachari contributes a chapter on kala-azar; half the space devoted to this important disease is occupied by an exhaustive bibliography, while the section on treatment is mainly concerned with the results of recently elaborated antimony compounds. This section is particularly fully illustrated, especially by means of maps.

This stupendous work suffers from the great disparity in the value of the articles. Moreover, its very completeness tends to make it unwieldy. But the worker in tropical diseases, especially one who is remote from libraries, will find in this volume a complete exposition of the subject. The names of many English authorities in the bibliography are strangely misspelt.

INFANT WELFARE.

By H. H. CHODAK GREGORY, M.D., M.R.C.P., Assistant Physician, Royal Free Hospital; Physician, East London Hospital for Children, Shadwell. London: H. K. Lewis. 1926. Pp. 144. 4*s.* 6*d.*

THIS little book is primarily intended for practitioners who are engaged on work in infant clinics. The first chapter is directly concerned with the management and scope of the clinic, and the special problems which arise there are discussed. The rest of the book forms a guide to the feeding and management of infants which is equally applicable to the clinic and the home. The advice which is given on nursery hygiene in general is extremely practical and is clearly expressed. The author rather curiously champions the "dummy"—when used for a few minutes only—as a stimulus to sleep. It must certainly be admitted that no harm will arise from its use in this way alone, yet it may be that the French Government, in forbidding recently the sale of the "sucette," have adopted the more prudent course. The instructions on breast and artificial feeding are sound, and have the great merit of being simple. Recognition is given both to the advantage and the practicability of using fresh cow's milk when breast feeding is not possible. It will, perhaps, be helpful to some of the less advanced readers if in a future edition some tables of specimen feeds are included. The book deals in the main with the normal, but the last chapters contain an excellent summary of the significance of some common symptoms.

This is altogether an admirable book, which should be of great assistance to a much larger class than the medical officers for whom it is specially intended. It may be strongly recommended to nurses who are preparing for the examination for the Sick Children's Register, and it should make profitable reading for an intelligent mother.

U.S. MEDICAL DEPARTMENT AND THE WAR.

The Medical Department of the United States Army in the World War. Vol. XV. Statistics, Part II.: Medical and Casualty Statistics. Washington: Government Printing Office. 1925. Pp. 1368. $3.

THIS is a handsomely printed book of elaborate statistics, set out on large and expensive pages, and sold for 12*s.* It tells in great detail how the U.S. Army grew month by month, and how it was demobilised, what were the admissions for disease and injury, the discharges for disability, and the deaths in the various classes of soldiers, white, coloured, Filipino, &c., both absolutely and per thousand. Then there are statistics of the health of the individual training camps in the United States, and tables, never before attempted, showing for each day in 1918 up to the armistice how many of each infantry, artillery, machine-gun, and engineer unit were gassed, wounded, or killed in action day by day. A diagram on p. 1020 shows the case mortality of those wounded by each form of enemy action, and the highest case mortality is that from sword wounds. Lest this unduly encourages some devotee of the *arme blanche*, we hasten to add that only 12 of such wounds are reported, of whom 3 died, while of 235 bayonet wounds only 4 died. Of gunshot wounds there were 7474 deaths among 74,833 wounded. There is required some universal notation to show in such diagrams which figures have weight behind them, which have not. In all there were 36,694 (3·5 per cent. of the army) killed in action, 224,089 (21·3 per cent.) wounded, of whom 13,691 (1·3 per cent. of the army) died. Nearly half the infantry became casualties in action. It is interesting to note that admissions for drug addiction increased relatively to those for alcoholism among white soldiers in the United States up to the armistice, and then at once fell off. It is not clear how many men of the Expeditionary Force in Europe died, of what diseases, or what proportion the deaths from disease bore to the deaths from wounds, but in other respects the statistical information offered on the diseases and casualties of the war is of great interest.

CLINICAL NOTES AND DEDUCTIONS.

Being Fads and Fancies of a General Practitioner. By MARY C. DE GARIS, M.D., B.S. Melb. London: Baillière, Tindall and Cox. 1926. Pp. 176. 7*s.* 6*d.*

Miss de Garis has evidently given much thought, born of experience, to her subjects. She devotes the first 40 pages to the subject of labour. Labour ought to be practically painless, she holds, and the frequent occurrence of pain is due to primary inertia; this again is thought to be due to certain constitutional factors—e.g., endocrine deficiency and especially dental sepsis and dietetic errors. No very satisfactory facts are adduced to support these hypotheses, but the desirability of more exact obstetrical research is thereby emphasised and advocated. Dental sepsis figures prominently and is given a section by itself, and cases are quoted to show the effects of it in arthritis, psychoses, and renal and cardiac troubles. Shorter articles follow on whooping-cough, malaria, and diphtheria, on isolated cases, and on medical subjects. The book ends with a pleasantly written description of a Scottish women's hospital in Macedonia.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXIX., No. 2. April, 1926. Pp. 141–221.—The Occurrence of *Brucella abortus* and *Mycobacterium tuberculosis* in Cows' Milk, by G. S. Wilson and M. M. Nutt (Manchester). Samples of Manchester milk contain *B. abortus* in 8 per cent. and tubercle bacilli in 13 per cent.—On Bacterial Variation with Special Reference to the Alleged Convergent Phenomena Exhibited by Certain Distinct Pathogenic Species (*B. typhosus* and *B. enteritidis* Gaertner), by A. N. Goyle (London). A thorough study of the serological relationships of the various forms of typhoid and Gaertner bacilli which, in some respects, show a curious overlapping.—A Reticle of Endothelial Cells in the Thyroid and Parathyroid, by G. S. Williamson and I. H. Pearse (London). The endothelial system of the thyroid contains many large granular cells resembling tissue mast cells; their abundance and cytoplasmic structure vary with states of functional activity.—Heterologous Cancer Grafts, by J. Gheorghiu (Brussels and London). Mouse cancers will grow for a while in new-born rats and may be so propagated for as many as 20 passages extending over more than a year. But the tumours never lose their species-specific character nor will they grow in adult rats.—The Influence of Thyroid Feeding on the Islets of Langerhans in the Guinea-pig, by G. R. Cameron (Melbourne). Causes hypertrophy of pancreas and a more than proportional increase of islet tissue.—An Epidemic

Affecting Stock Rabbits, by G. R. Cameron and F. E. Williams (Melbourne). An epidemic of suppurative lesions about the head and neck due to an organism similar or identical to those described by Schmorl and Beattie.—Arthritic Muscular Atrophy: the Oxygen Consumption of Atrophied Muscles, by A. E. B. Harding (London). Muscles wasted in sequence to an experimental arthritis use more oxygen than normal muscles and more than muscles wasted from simple disuse.—"Calcification" in the Rabbit's Brain, by C. Da Fano and J. R. Perdrau (London). In two animals inoculated with encephalitic material changes were found similar to those known in human brains as "calcification," though the abnormal deposit seems to be mostly composed of iron salts.—The Four Human Blood Groups, with Special Reference to their Agglutination Titres and to Abnormal Donors, by A. R. Jones and E. E. Glynn (Liverpool). A careful quantitative study of iso-agglutinins in 40 persons. Titres vary widely and need consideration in transfusion; thus the serum of a "universal donor" may agglutinate so strongly as to cause trouble when it is diluted in the circulation of the recipient. Seven examples of abnormal agglutination were found.—Bacterial Contamination of Commercial Peptone, by H. D. Wright (London). Some examples of peptone contain so many dead bacteria that they may be easily found microscopically in broths made with them.

JOURNAL OF INDUSTRIAL HYGIENE, March, 1926.—R. J. DeMotte, speaking from his experience, maintains the thesis that antiseptics should have little to do with the treatment of accidental wounds which are disinfected by Nature's own antiseptics, the blood and serum. Rational treatment should consist in helping nature with mechanical measures which are outlined.—The chief contribution in this number deals with lead poisoning among oxyacetylene welders employed in scrapping naval vessels. The trouble is one which has arisen also in this country. Detailed statistics are given which exhibit for an average personnel of 73 men an average of 253 working days lost per month as a result of plumbism; the shortest period of exposure was seven days and the longest 2·4 months, but the men for the most part were newly employed at this work. Hence, symptoms of chronic lead poisoning were not to be expected. Clinical findings are quoted of which the absence of hypertension is the main point worth recording. The poison was absorbed by breathing lead fumes generated when the hot flame was brought to bear on old paint on the ships' plates. Preventive measures are particularly difficult to install.——April, 1926.—A statistical study of occupational diseases reported in the State of Ohio is given by E. R. Hayhurst and D. J. Kindel. It is concerned with 3226 cases notified by doctors under legal obligation during five years ending June 30th, 1925. The list, which includes all eligible for compensation diseases, and some others, is far wider than that of our Factory Act. Dermatoses account for 2264 cases, lead poisoning for 431, and benzol and its derivatives for 55. The rubber industry is responsible for nearly all the dermatoses which are separately tabulated by the process concerned. The lead poisoning cases also are separately tabulated; the manufacture of storage batteries accounts for 145 cases, painting motor-cars for 114, and the manufacture of white lead for 54. Information is given as to the age-distribution of these cases. The authors note that an increase has taken place both in the number and range of occupational diseases, and conclude that one of the most profitable investments in the entire industrial field is the control of industrial health.—L. T. Fairhall considers the estimation of zinc in organic matter, and points out how quantities of zinc ranging in amount from 0·002 mg. to 50 mg. can be satisfactorily estimated within 5 per cent. of the amount actually present.—R. T. Lutz reviews the literature of the occurrence of zinc in tissues and presents a study of its normal distribution in the rat, cat, and man. He considers that traces of zinc in animal tissues are normal and universal, since this metal was found present in every sample analysed. He puts forward as a probable hypothesis that, in any given tissue of an animal species, there is a definite normal concentration of zinc which is constant within a small range. This article contains much detailed information given in tabular form.

New Inventions.

AN IMPROVED ANÆSTHETIC APPARATUS.

THE accompanying illustration depicts the latest improvements in this machine. The water sight feed for mixing the N_2O and O of the new set of triple bottles is substantially the same as it has always been, but the mounts for the ether and chloroform bottles are worked on a different and, I think, an improved principle. They are called the "1926 type," and are also made with twin bottles where one is not

required for chloroform. In place of the two levers of the older type, one for "on" and "off" and the other for the degree of saturation required, I now have one lever only which, when moved over a semi-circular scale, causes the gases to go either through a by-pass or partly through the by-pass and partly into the anæsthetic, or entirely through the anæsthetic as required. By setting the lever to such a position that only a fraction of the gases bubble out of a small hole drilled near the bottom of the long tube in the anæsthetic bottle, a very lean mixture is obtainable, and on the other hand, even with a full flow and a high pressure, leakage is negligible. This new arrangement of levers enables one to regulate the amount of ether or chloroform with far greater accuracy than was possible formerly. For those who want to use a large quantity of ether, there is provided a hot-water cup to enclose the ether bottle as a precaution against freezing. The lamp to prevent the gas from freezing, which was always a source of danger, has been omitted. This has been rendered possible because the makers now provide non-freezing gas, but in any case I find that a small hot-water bottle placed on the side of the reducing valve of the gas bottle prevents freezing and enables one to get a steady flow of N_2O.

I have to acknowledge my great indebtedness to Mr. Wellesley, of Coxeter and Son, Ltd., for producing such an excellent method of controlling the small amount of ether or chloroform that is used.

H. EDMUND G. BOYLE, O.B.E., M.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, MAY 29, 1926.

DISINFECTION AND DISINFECTANTS.

DISINFECTION has long bulked largely in the armamentarium of health departments. The minds of the early epidemiologists and sanitarians were turned toward disinfection as a result of the discoveries of PASTEUR, the identification of many micro-organisms in air, dust, and clothing, experimental proof of the lethal effect on them of chemicals and heat, and the demonstrable value of antisepsis as practised in surgery by LISTER and his followers. The importance of infected premises and fomites seemed to be established by the failure of rigorous isolation of cases and surveillance of contacts to stem the flood of epidemics. The efficacy of disinfection in controlling certain diseases appeared to be proven, and it was believed that all infection being microbial was open to the same means of attack. As departmental machinery for discovering infective persons became more perfect the significance of anomalous, mild, and missed cases in the spread of infection was revealed, but this knowledge of exceptional situations to which terminal disinfection was not applicable in itself was not sufficient to undermine a general belief in the virtue of disinfection. Even although LÖFFLER had, as early as 1884, recorded the presence of typical diphtheria bacilli in the throat of a healthy child, it was not till well after 1894, when the work of PARK and BEEBE was published, that the significance of the "carrier" came to be recognised. Since then, the mass of bacteriological and epidemiological evidence accumulated in relation to diphtheria, the enteric fevers, the dysenteries, cholera, cerebro-spinal fever, and even scarlet fever has thrown a fresh light on many of the older observations which seemed to implicate inanimate media of infection. Consequently, the younger exponents of preventive medicine are becoming more and more sceptical about disinfection.

The earliest public health administrator to advertise his conversion was Dr. C. V. CHAPIN, Superintendent of Health, Providence, U.S.A., who boldly dropped terminal disinfection for scarlet fever and diphtheria in 1905 without untoward result. His views are now generally accepted in his own country, as may be seen from the meagreness of the reference to disinfection in the most recent American book on Public Health Law, a review of which appears on p. 1041 of this issue. In England the tendency of the younger school of sanitarians may be gathered from the inaugural address [1] of Dr. G. F. BUCHAN to the Society of Medical Officers of Health and from a recent discussion of the Fever Hospital Group of that Society. At both these meetings records were produced which seem to show that cases of delayed secondary infection are no more common when terminal disinfection for scarlet fever and diphtheria is neglected or perfunctorily applied than if it is carried out as thoroughly as such things can be done on the large scale. That the later doctrine has its disciples in Germany is indicated by a recent article [2] by Dr. W. RIMPAU, director of the Bacteriological Institute in Munich, who quotes CHAPIN with approval, while he advocates instruction of school-children in the objects and methods of concurrent disinfection of articles soiled by the infective patient. The public health officer in this country must, of course, anticipate opposition from the people to any departure from a measure on which they have been taught by his predecessors to place reliance. When an outbreak of infectious disease occurs in connexion, for instance, with a school, drains and disinfection are the first things that occur to the minds not only of the parents but even of the teachers. The unorthodox official must take the risk that an epidemic, for some imperfectly understood reason, may follow the inception of his new policy and the coincidence be mistaken for effect. Nevertheless, it is imperative to educate a public which is not likely to accept the modern method of preventing diphtheria and scarlet fever by active immunisation so long as it is allowed to believe that spraying and fumigation of schools and the liberal use of disinfectants at home are a real safeguard against casual infection. Their enlightenment is a function not of the health officer but of the whole medical profession.

It should be our concern, however, to watch that the pendulum is not allowed to swing too far in the opposite direction. Prof. RIMPAU suggests that the established value of certain means of disinfection under specific conditions should be brought even more prominently before the people than is done at present. To this end we commend to practitioners Prof. H. R. KENWOOD'S article in our present issue (p. 1055). He is a firm believer in the value of disinfection scientifically applied, and his laboratory and field experiments enable him to speak with authority on the relative potency of various disinfectants as well as the conditions most favourable to their action. The present revision of ideas among health officers is reflected, too, in a tendency to question the advantage of wholesale hospital isolation for scarlet fever which may lead to an increase in the home treatment of these diseases. Under such conditions, it is agreed that assiduous concurrent disinfection, however simple in character, is required. The information conveyed in Prof. KENWOOD'S paper should be of real value for this purpose. Finally, it should be made quite clear that the failure of disinfection to stop the spread of air-borne infections does not belittle the part it has taken in the suppression of the diseases communicated by the alimentary route or by inoculation. Just at the moment when fumigation is regarded by most sanitarians as the form of disinfection which can most safely be discarded, its use is being extended for the destruction of vermin, especially on board vessels. It is our strongest weapon against the rat and the flea, and its importance is commensurate with the world prevalence of plague. The port sanitary officer who has to deal rapidly with the holds and crews' quarters of vessels infested with all sorts of parasites retains his respect for fumigation. As in other applications of science, it is only the blind routine of its use on a large scale which has brought discredit on a measure which is of immense value when used at the right time, in the right place, and in relation to the medium of infection to which it is properly applicable.

[1] Public Health, November, 1925.

[2] Münchener Medizinische Wochenschrift, March 5th, 1926.

THE PRECANCEROUS STATE.

THE precancerous state has recently received a good deal of attention. It has been the subject of a discussion in the Section of Surgery of the Royal Society of Medicine.[1] Sir LENTHAL CHEATLE, who for many years made this problem, as applied to the breast, his special study, has published another paper on it under the title Desquamative and Dysgenetic Epithelial Hyperplasias in the Breast.[2] Prof. HORST OERTEL, of Montreal, has discussed it in an address on Involutionary Changes in Prostate and Female Breast in Relation to Cancer Development.[3]

The difficulty of the problem begins with the definition. Dr. J. H. SEQUEIRA, who opened the discussion at the Royal Society of Medicine, began with the statement: "I find it a little difficult to define exactly what is a 'precancerous' condition, although I think we are all aware of what is generally understood by that term." CHEATLE expresses himself in equally diplomatic terms. In describing a certain form of what he terms "dysgenetic epithelial hyperplasias," he states that it is histologically more nearly connected with a condition of early carcinoma than any other pathological process in the breast and that it, therefore, represents the "precancerous" condition. But, he adds, "I would lay it down as a law that there is no kind of epithelial hyperplasia that will inevitably end in carcinoma." His views on this subject demand special respect because they are based on a study of sections of the whole breast. In this way he has been able to collect unique material and to observe the earliest hyperplastic changes, occurring sometimes only in a single duct. He correlates the various changes in a sequence of events which begins with what he terms a desquamative epithelial hyperplasia. The next change is a condition of dysgenetic epithelial hyperplasia in which the epithelial cells retain their normal structure. In that stage they frequently produce papillomata confined within the acini and terminal duct. This stage is followed by the precancerous state in which the individual cells show signs of beginning malignancy—nuclear hyperchromatosis, variation in size of cells and mitoses. In this state the hyperplastic changes are still confined within the ducts and terminal acini. When it extends beyond these and invades the surrounding connective tissue the development of carcinoma has been reached. Sometimes the precancerous state may be seen in the centre of a fully developed carcinoma. CHEATLE points out that these various hyperplastic changes find a complete parallel in the changes seen in the skin of mice subjected to tar painting. These contentions are illustrated by numerous clear figures accompanying the paper. OERTEL, on the other hand, looks upon these hyperplastic changes, which he has studied in breast and prostate, as regressive changes accompanying the physiological involution of these organs. Morphologically they may give the appearance of malignant new growths so completely that he has frequently diagnosed them in the past as "early cancer" or at least as "suspicious of early cancer." But the frequency with which such conditions occur in the two organs during the regressive periods of life leads him now to believe that they are only potentially cancerous and require yet an additional factor to elicit malignancy. Following BORST, he prefers the term "carcinoid" to the term "precancerous." His statement of the great frequency with which such hyperplastic changes occur in the senile prostate finds confirmation in a recent paper by NELLER and NEUBÜRGER[4] who discovered them in approximately every fourth senile prostate.

The problem of the precancerous state is obviously intimately bound up with that of the ætiology of cancer. The search for a precancerous state follows naturally from the conception of cancer as a biological cellular change. If cancer is the expression of some change in the internal structure or metabolism of the cell, it is most probable that such a change would set in gradually as the result of a slow process occurring in the cell. This preparatory stage would then represent the precancerous state. But if we accept GYE'S conception and look upon cancer as resulting from the entrance of a virus into a cell, then these hyperplastic conditions would merely represent one of possibly many conditions which predisposes a cell for the attack by the virus. If the virus is not present they will never develop into cancer. On the other hand, it is conceivable on this view that cancer may arise without being preceded by any of these hyperplastic changes. The problem of the precancerous state is of more than academic interest, since the question naturally arises whether the presence of a precancerous condition does or does not call for operative removal. The possibility emphasised by OERTEL that the histological picture of a precancerous or carcinoid condition may be mistaken for an early carcinoma must be taken into consideration as a possible fallacy when claims are made of a cure of an early cancer. The final solution of the problem of what constitutes a precancerous state will have to wait upon further advance in our knowledge of the ætiology of cancer.

[1] Proc. Roy. Soc. of Med., Sec. Surgery, November 4th, 1925.
[2] Brit. Jour. Surg., 1926, xiii., 509.
[3] Canadian Med. Assoc. Jour., 1926, p. 237.

"B. C. G."

IN one of a series of American public addresses printed in our present issue, Sir ARTHUR NEWSHOLME considers the age-incidence of mortality from tuberculosis and shows that the risk of the acute form of the disease is greatest in the first two or three years of life. Hence arises the supreme importance of protecting young children from infection. Prof. A. CALMETTE has made a bid to protect these children by inoculating them, before infection can occur, with an attenuated living tubercle virus, and Dr. J. G. ADAMI, in an address, which also appears in this issue, describes CALMETTE'S work as a magnificent advance, important for the prevention of both human and bovine tuberculosis. We have already referred[5] to the technique of this prophylactic vaccination, the results of which are now assembled in a monograph appearing in the February number of the *Annales de l'Institut Pasteur* and in the *Revue de la Tuberculose* of the same month. As long ago as 1909 CALMETTE described a strain of tubercle bacillus grown on glycerinated ox bile and now known shortly as B.C.G. (Bacille Calmette-Guérin). The microbiological properties of this strain have nowhere been set out exactly, but it is presumed that CALMETTE and GUÉRIN have used throughout the virulent bovine strain designated *lait de Nocard*.[6] B.C.G. was subcultured 230 times up to January, 1921, the date at which the vaccination experiments were started. It was then incapable of producing tubercles, either by intravenous, intraperitoneal, or subcutaneous inoculation or even by ingestion. The cultures resembled

[4] Münchener Med. Woch., Jan. 8th, 1926.
[5] THE LANCET, 1925, i., 1352 and 1363.
[6] Annales de l'Institut Pasteur, 1924, xxxviii., 371.

those of glanders in appearance, and massive infection in calves caused a general disease resembling typhoid fever which cleared up spontaneously after 15–20 days of fever without producing the slightest tubercle formation, as proved by subsequent autopsy of the animals.[7] In preparing the vaccine, B.C.G. is now cultivated on potato and glycerinated veal broth, or on Sauton's asparagin medium. The cultures should not be more than ten days old, or, the authors state, they will contain too many dead bacilli. The vaccine is administered in milk at body temperature in three doses and is harmless, giving rise to no digestive trouble or malaise even in new-born infants. It can be obtained ready for use from the Pasteur Institute in Paris.

B.C.G. vaccine has been tested by CALMETTE and his co-workers on an extensive scale in rabbits and guinea-pigs, a partial immunity being obtained lasting for six months. In calves the vaccination was found to be successful only in animals under the age of 15 days; prophylaxis was obtained by a single injection of 50–100 million organisms and was found to last for about 12 months. The number of calves thus immunised up to the end of 1925 was 3051, and the authors state that the growth of these animals has been satisfactory and that no harmful results followed the vaccination. Experiments on higher apes made by WILBERT in 1923 and 1924 suggested that B.C.G. vaccine affords protection at all ages against infection from cohabitation with animals experimentally infected with tubercle. WILBERT [8] who conducted these experiments on behalf of CALMETTE, tested 15 chimpanzees and 59 other apes. In the case of the former three were vaccinated with B.C.G., five were infected with virulent cultures, and seven were retained as controls. These experiments were started in February, 1924. The five infected animals died quickly from tuberculosis as did also four of the controls, the remaining three controls succumbing to an accidental infection of bacillary dysentery. The three vaccinated chimpanzees were alive and well in June, 1925. Of the 59 other apes 19 were vaccinated with B.C.G., 20 were infected with virulent cultures of tubercle bacillus, and 20 retained as controls. Among the 19 vaccinated animals (between September, 1923, and February, 1924) 6 remained alive and well in June, 1925, the other 13 having apparently died of accidental infections and trauma. Of the 20 infected animals 19 died meanwhile of tuberculosis, whilst of the 20 controls a similar number also succumbed to tuberculosis.

In 1921 CALMETTE and his co-workers proceeded to vaccinate new-born infants by this method, and up to the end of 1925 had treated 1317 infants. The results are divided into two groups: (1) 564 cases (of which 231 had been in contact with tuberculous cases) under observation for 12–18 months, of whom only two are known to have died of tuberculosis and 43 of other diseases; (2) 753 cases (of which 355 had been in contact with tuberculous cases) under observation for 6–12 months, of whom 9 are known to have died of tuberculosis and 53 of other diseases. It would have been easier for others to assess the value of these figures if they had been returned as numbers of children alive or dead at three separate age-periods—e.g., 6, 12, and 18 months. The age at death of the 11 infants (taking the two groups together) who died of tuberculosis, was under 6 months in all cases but one. The figures, therefore, show that of 1317 cases vaccinated 10 had died of tuberculosis by the end of the first six months. It would be unwise to draw further deductions since there is, obviously, a difference of six months between the youngest and oldest infant in each of these two groups. The infants vaccinated have been kept under observation, and where their environment proved to be unsatisfactory they have been boarded out, but the statistics given do not show the proportion of children thus removed from their homes. This omission makes it difficult to compare the figures with those for an ordinary infant population. There is a further difficulty in that the death-rate from tuberculosis in infants in the normal population of France is not given, although CALMETTE states that in the case of infants born of tuberculous parents and placed with healthy foster-mothers shortly after birth the mortality from tuberculosis is approximately 7 per cent. in the first year. Finally, this method of prophylactic vaccination has been applied to 3352 infants and 631 adults among the endogenous population of French colonies. It is evident that CALMETTE and his co-workers have carried out an important and extensive sociological experiment on bacteriological lines, of which the ultimate results will be awaited with much interest. At the present moment the data are too vague and lacking in controls and the period of the experiment too short for anything like a final judgment.

[7] Tubercle Bacillus Infection and Tuberculosis in Man and Animals. By A. Calmette. English edition by W. B. Soper and G. H. Smith. Baltimore. 1923. Pp. 654.

[8] Wilbert, J.: Annales de l'Institut Pasteur, 1925, xxxix., 641.

PROTECTION FROM THE PHOTOGRAPHER.

ON Tuesday next, June 1st, there will come into operation a beneficent enactment whereby medical practitioners who are called upon to give evidence in *causes célèbres* will be protected from the risk of a form of publicity which they sometimes encounter but seldom enjoy. The new law makes it an offence, punishable summarily by fine not exceeding £50, to photograph in any court any person who is either a judge or a juror or a witness or one of the parties in the case. Sketching or any other kind of portraiture attempted in court with a view to publication is similarly prohibited, as is also the actual publication of any such photograph taken or sketch made in contravention of the new interdict. Although these provisions occur in a statute called the Criminal Justice Act (which otherwise deals mainly with criminal procedure at assizes and quarter sessions and before the magistrates), they extend to all sorts of courts, civil as well as criminal. "Court" means any court of justice and includes a coroner's court; "judge" includes a coroner. Finally, photographing or sketching is deemed to occur in court if it takes place within the precincts of the court buildings or if the victim is photographed while entering or leaving the court-room or the precincts of the building. The new provision will not, of course, prevent the publication of studio portraits of medical practitioners who happen to be witnesses in some case which attracts public attention. The battery of press photographers, however, often to be seen outside a court-house on the morning of some sensational trial will have its guns spiked—unless, indeed, it is still permitted to photograph barristers and solicitors to whom Parliament does not seem to have given the same measure of protection.

ALEXANDRA DAY.—The date of Alexandra Day has been postponed from June 9th to June 30th. The organising committee is in urgent need of assistance and would welcome helpers in depôts, rose sellers, and the loan of motor cars on June 28th, 29th, and 30th. Money collected on Alexandra Day is distributed amongst hospitals and charities for the sick. Anyone who will help should write to Miss C. M. Beeman, 33, The Grove, The Boltons, London, S.W. 10.

Annotations.

"Ne quid nimis."

MUNICIPAL CONSULTING OBSTETRICIANS.

THE Metropolitan Borough of Hampstead recently invited applications for the new posts of consulting obstetrician, several of whom are to be appointed as the outcome of a recommendation by a special medical subcommittee. The infantile mortality-rate of the borough is already low—56 per 1000 births in 1924; the maternal death-rate has been reduced to about 3 per 1000 births, the general death-rate being 11 per 1000 of the population. Still further reduction in maternal and infantile death-rate is, however, aimed at, and to this end a subcommittee, consisting of three medical members of the Maternity and Child Welfare Committee, with a lay chairman, was appointed in 1923, the reference being the investigation of the deaths of infants under 2 years of age, of still-births, and of maternal deaths. A comprehensive inquiry was made into the circumstances of 83 infantile deaths, 3 maternal deaths, and 26 still-births notified in 1924; in his annual report for that year Dr. F. E. Scrase, the medical officer of health, notes how friendly and helpful were the replies of local practitioners to a circular letter inviting opinions as to the causes of the still-births occurring in their practice, and suggestions as to the prevention of these in the future. The most important recommendation of the medical subcommittee which sifted the evidence obtained was that in difficult cases the services of a skilled obstetrician should be available to supplement those of the practitioner, and this recommendation is now being carried into effect. Five experts have now been appointed in the persons of Miss M. Basden, Mr. A. O. Gray, Mr. C. S. Lane-Roberts, Dr. S. G. Luker, Mr. L. C. Rivett. They are not to be called in by midwives direct, but are to be at the disposal of practitioners in cases of grave difficulty. Their guaranteed fee of five guineas per case will not vary whatever the services rendered; this fee is recoverable in whole or in part from the patient at the discretion of the borough council. It is anticipated that beds may be available, but in this respect the scheme has yet to be elaborated. We congratulate the borough of Hampstead on a wise endeavour to attack the problem from both ends, since pari passu with this emergency organisation antenatal vigilance is to be still further pursued. Many of Dr. Scrase's colleagues assume that the elaboration of facilities for examination of prospective mothers is all that is needed to prevent difficult or at any rate disastrous labours. Of recent years the value of preventive measures such as antenatal examination has, perhaps, been overstressed, for the methods available for estimating in advance the relative sizes of the full-term child and of the pelvis are still far from perfect. However carefully the patients' histories and measurements may have been taken, a certain proportion will surprise the midwife at the time of labour and perplex if not alarm the doctor summoned to her help. It is in these cases where skilled manipulation by one who is constantly dealing with similar emergencies may save the mother at least from severe laceration and the child from probable death. The very fact that an expert may be summoned at need will give the practitioner confidence, and the success of the experiment will certainly not be measurable by the number of times that the consultants are called in. It seems to us likely that other local authorities will find it expedient to follow the example set by Hampstead in this matter.

PSYCHOTHERAPY IN UROLOGY.

IN a recent number of the *Medizinische Klinik* (Jan. 9th, 1926) Dr. J. J. Stutzin puts forward an interesting point of view in his article on Psychotherapy in Urology. Monumental work has been done in the past forty years in various branches of science, and corresponding advances in the treatment of disease have followed, but a doubt has come to Dr. Stutzin as to whether, in the general striving after perfection of methods and technique, the personality of the patient is not being neglected. Beginning with a short disquisition on our present knowledge of the sympathetic and parasympathetic nervous systems, he points out that they are very much bound up with the mental state of the individual, and that the emotions, therefore, have a direct bearing on the tone and action of the viscera, which are controlled by the so-called vegetative centres. Again, there is a constant play of reflexes between the voluntary and involuntary systems, as witnessed by the rigidity of the abdominal muscles, which may be caused by an inflamed intestine, and the cardiac palpitation brought on by fright. Even before this was fully understood various attempts, more or less empirical, were made to treat disease by psychotherapy. The writer divides these methods into two groups: "diversion," including suggestion, autosuggestion and hypnotism, and "disinfection"—namely, psycho-analysis. Of these, he considers psycho-analysis unproductive as compared with the time it takes, and hypnotism unjustifiable in view of the inroads it makes on the individuality of the patient. He confines himself, then, to suggestion. Passing on to the special subject of urology, Dr. Stutzin points out that no single organ or system of organs can be considered apart from the rest of the individual. For the sake of convenience a specialty may be created, but this is hardly a biological one. The urinary tract, being so closely associated with the generative system, is peculiarly liable to be affected by emotional disturbances. The urologist is primarily a craftsman; his pre-occupation is mainly surgical, and, although he may keep an open mind on speculative questions, yet his line of treatment is always practical. It is not suggested that the treatment of organic lesions may be neglected. The first thing to be decided is whether such a condition exists and, if so, whether it can be held responsible for the whole symptom-complex, or whether some psychic influence is at work as well. If no material cause is detected we are faced with the question: Can the clinical picture be fully explained by an emotional cause, or must there be some yet undiagnosed organic basis? This is where the fully-trained doctor, who is able to recognise a pathological condition, has the advantage over the lay practitioner of suggestion, who may perhaps bring a well-arranged scheme of treatment by suggestion and a thoughtful personality to bear on some disease which has no chance of alleviation by such means. Recent work tends to show that, although the secretory system is not under the control of the voluntary centres, it can be subjected to direct influences. Heilig, of Vienna, has proved in a long series of cases that, in the hypnotic state, painful sensations cause polyuria, and pleasurable ones oliguria; and, as the result of these and other observations, sundry operations on the nerves of the renal hilum have been devised. The operators, however, are apt to forget that the sympathetic system is far too complicated and delicate a structure to be coerced in this way, and the results, though they may be good at the time, are apt to be bitterly disappointing to the patient in the long run. A similar experience is that of Glaser, of Berlin, who reports cases of bronchial asthma, intractable after phrenicotomy, which have yielded to suggestive treatment. Dr. Stutzin cites various cases in which alarming symptoms, such as severe renal hæmorrhage and renal colic, were proved by exhaustive examination to have been brought on by mental states, analogous to the way in which certain fakirs can by the exercise of will power prevent or cause the escape of blood from a wound.

Furthermore, these cases have been cured by treatment of the mental state. The bladder, the ultimate nature of whose nervous mechanism and musculature has not yet been worked out, is very greatly affected by the emotions, as witness its irritability under the stress of nervous conditions; a clinical manifestation of this irritability is nocturnal enuresis. Dr. Stutzin does not make any exaggerated claims for his methods, but rather puts forward a plea for a broad outlook in diagnosis and treatment.

INSURANCE OF PROPERTY AND CIVIL DISTURBANCE.

THE cars of many of our readers are insured through the Medical Insurance Agency under the Doctors' Special H.P. Motor Policy (Lloyds). In Section 2 of this policy, under the heading Accidental Damage, it is stated that the underwriters shall not be liable for wear and tear, or depreciation or mechanical breakdown, but shall indemnify the insured in respect of damage caused by collision with any other object, resulting from wear and tear or mechanical breakdown, and shall also indemnify the insured in respect of external damage to the insured car wilfully caused by employees during elections or during riots or civil commotions. It was stated by the Medical Insurance Agency, in a letter which we published last week, that this policy covers any damage that may be done to the holder's car during any civil disturbance, including such acts on the part of strikers as removal of carburettor, slashing of tyres, puncture of petrol tank, &c., or damage caused by stones thrown at car. It is not necessary to procure these benefits that the car shall be labelled "Doctor's Car," though where a car is being used only for professional purposes such a label would seem advisable. If a car is not used for its normal purpose the policy will be invalidated unless previous notice has been given and the assent of the underwriters obtained. For example, a private car is not normally used for the conveyance mainly of foodstuffs, but a four-seater car could carry four passengers even though they be not personally known to the owner and the policy would remain in full force. Damage to springs due to overloading is not covered under the policy whatever the cause of the overloading may be. The Medical Insurance Agency also informs us that the holders of the "Comprehensive" Household Policies of the type issued through the Agency are covered for damage by riots and civil commotions. This is not necessarily true of holders of fire and burglary policies or "combined" household policies.

FROIN'S SYNDROME.

IN 1903 Froin described a group of signs in the cerebro-spinal fluid which has come to be known as Froin's syndrome; the signs were yellow colour, massive coagulation of the fluid in the tube or even in the needle, and the presence of a large number of cells. This group of changes has excited much interest among clinical neuropathologists, and many of them have desired to modify it in some way; thus, the combination of yellow colour and massive coagulation, regardless of the number of cells, often goes by Froin's name, and Greenfield and Carmichael [1] wish to apply the term syndrome of Froin to fluids which contain 0·5 per cent. or more of protein, whether spontaneous coagulation occurs or not, and whether the fluid is xanthochromic or not. The diseases with which the syndrome is associated are, except in rare instances, conditions involving spinal compression, and when the complete syndrome has been found the compression has usually been due to syphilitic pachymeningitis. The current number of *Minnesota Medicine* [2] contains an important article by Dr. Gordon Kammon, in which the history of the subject is reviewed and four cases are described in which Froin's syndrome or a modified form of it was found. It is a curious fact that while to-day the presence of Froin's syndrome is always considered suggestive of a spinal tumour, none of Froin's original cases were tumours; one was a case of meningo-myelitis, another had multiple tuberculous foci in the bones, and the third was a case of ascending or Landry's paralysis. After Froin's observations other cases were soon reported, and by 1908 Sicard and Descamps went so far as to say that the syndrome always meant meningitis. During the next year, however, Blanchetiere and Lejonne found the same type of fluid, but without increase of cells, in a case of intramedullary spinal tumour, and this was soon followed by Nonne's observation that cord tumours are associated in general with a pronounced increase in the globulin content of the fluid in the lumbar cul-de-sac, without, as a rule, any change of colour or cell increase. Mestrezat considered that two factors were necessary for the production of Froin's syndrome, separation of the fluid in the lumbar space from the rest of the subarachnoid space, and engorgement of the veins or inflammation of the walls of the vessels below the site of blockage. Ayer brought about the syndrome in cats by causing extradural pressure on the cord by means of paraffin. In 1923 Cushing and Ayer reported five cases in which xanthochromia with the occurrence of a spontaneous coagulum was found in the fluid *above* tumours of the cauda equina, and in the next year Hammes also recorded a case of this type. In view of these observations the theory that loculation plays any essential part in producing Froin's syndrome is no longer tenable: Cushing and Ayer differ in their opinions as to its actual cause, the former holding that it is produced by a transudation into the fluid from the tumour itself, while the latter ascribes it to transudation from engorged veins in the spinal canal. Considering the variety of conditions other than tumours—polyneuritis, tuberculous meningitis, poliomyelitis—in which the syndrome has been found Ayer's theory is the more acceptable. Dr. Kammon does not seem to have been acquainted with a very important and comprehensive article by Greenfield [3] on this same subject.

HEALTH CERTIFICATES BEFORE MARRIAGE.

THE Royal Institute of Public Health, in session at Bristol last week-end, gave consideration to the advisability of a health certificate before marriage. In the May number of the *World's Health* Dr. Leopold Bard, of Buenos Aires, discusses the Bill dealing with this subject which is now before the Argentine Chamber of Deputies. In his opinion, venereal disease (except tertiary syphilis, and sometimes even tertiary syphilis) should constitute a temporary bar to marriage. What are likely to be the consequences of a marriage when the husband is suffering from venereal disease?—illness, disablement, still-births, poverty, unhappiness, or the bearing of degenerate offspring. One or all of these must be reckoned with. Just as the law provides a penalty for infanticide, so, thinks Dr. Bard, should it punish the spread of venereal disease through marriage. The proposed Bill provides that any man desiring to marry must, during the fortnight preceding the registration of his intended marriage, undergo a medical examination and provide himself with a certificate stating that he is free from venereal disease. This certificate must be furnished by a recognised physician. Provision for medical examination is made by the establishment at the National Public Health Office in the capital of a special bureau for the delivery of pre-matrimonial certificates. In villages or other remote places the certificates may be given by the local medical officer of health. No marriage will be registered without previous examination of the male party to it and without production of a certificate stating that he is free from venereal disease. Any

[1] The Cerebro-spinal Fluid in Clinical Diagnosis (London: Macmillan and Co., 1925), p. 97.
[2] Minnesota Medicine, April, 1926, p. 173.
[3] Greenfield: Jour. of Neurol. and Psychopath., 1921, ii., 105.

official delivering a marriage form without first demanding presentation of the medical certificate will be liable to punishment by imprisonment, and any physician knowingly making a false statement upon the certificate will be deprived of the right of exercising his profession in any part of the Republic for a period of three years. It will be interesting to see whether public opinion in the Argentine Republic is sufficiently awakened to the dangers of venereal disease for such a drastic measure to become law. The introduction of health certificates before marriage cannot be regarded as purely a health measure, for it touches a grave sociological problem. The institution of marriage is none too stable at the present day. Some may question the wisdom of placing new difficulties in the way of a legal union. May not this formality, slight though it may seem, be sufficient sometimes to tip the scale in favour of an illegal union, undesirable, as experience has shown us, both from the health and social standpoints? Suppose a young man is suffering from a venereal disease. If he has a social conscience he will undergo treatment before marriage. If he has no conscience he may evade the difficulty of a medical examination by contracting an illegal union. If, on the other hand, he be free from venereal disease, the health certificate before marriage is a useless formality. There is, however, this consideration in favour of such a certificate. Many public health workers are agreed that compulsory periodic medical examinations, if introduced, would contribute more than any other measure to the prevention of disease. The marriage certificate would constitute as valuable an index to the health of young men as the army medical examination which showed us up as a C 3 nation. Is it desirable, however, to link up a health measure with a basic social institution such as marriage?

DIGESTIVE ANAPHYLAXIS.

THE problems of human idiosyncrasy and tolerance have troubled clinicians from time immemorial, and the discovery by Charles Richet of the principle of anaphylaxis marked a distinct step towards their solution. In his earlier experiments he induced the reaction by intravenous injection but, since in practice the offending substances reach the system almost entirely by the mouth, it is "digestive anaphylaxis" which presents the really urgent clinical problem. Few besides those who have given special attention to the subject realise how long the list of possible causes and possible symptoms of this anaphylactic reaction is becoming. Even white wine, which no one would suspect of containing protein, is not guiltless,[1] and Bolten [2] shows that attacks of Czerny's disease and of dysmenorrhœa can both be released by anaphylactic shock. Sir Maurice Craig [3] has shown that certain forms of idiopathic epilepsy also depend on protein sensitivity, and, in fact, it seems probable that any kind of vago-sympathetic disturbance may be excited in this way. Arloing, Langeron, and Spassitch, whose previous work is well known, now set forth [4] the results of an extensive series of experiments on guinea-pigs, with the twofold object of increasing their sum of knowledge of the working of the phenomenon and of discovering the best defence against it. They employed two groups of antigens, one of unmodified substances such as horse serum, boiled cow's milk, olive oil, and solutions of glucose, quinine, and antipyrine, and a larger group composed of products of the artificial digestion of proteins, prepared for them by a well-known firm of manufacturing chemists. This was to eliminate the indigestion factor which is well known to produce anaphylactic reactions apart from the nature of the ingested substance. The latter group included beef, pork, casein, white of egg, fresh-water and sea fish, crab, mussel, and dried peas—all substances known to cause urticaria in human beings. The stock diet was two parts bran and one part hay, and the sensitising meal consisted of 3 c.cm. of peptone solution or 0·3 g. of unmodified substance. This was given on eight consecutive days, and then stopped for a period of 12 to 17 days to allow incubation. Now, the normal organism is protected against digestive anaphylaxis by two mechanisms: the mucosa of the small intestine, which will not allow the intact albuminoid molecule to penetrate it, and the liver, which acts as a barrier against protein. In order, therefore, to make sure of obtaining their reactions, the authors added to the meal small quantities of foreign (ox) bile which has the temporary effect of so altering the histological composition of the mucosa as to allow albumin to pass through it. After a certain amount of repeated anaphylactic shock, the whole of the liver begins to undergo necrosis and to lose its power of protecting the system against proteins. It has already been recognised that many anaphylactic reactions occur after enteritis or vague intestinal trouble, which would have the effect of making the mucosa penetrable.

The guinea-pig is regarded by the authors as a good subject for these experiments, for its behaviour gives ample evidence of the strength of the reaction. They relied on this alone, without testing for the hæmoclastic crisis, which might be affected by other causes. Pruritus, which always appeared, they considered a particularly good quantitative indication. No animal ever manifested convulsions. The syndromes produced were acute digestive anaphylaxis, primary protein shock (without previous sensitisation), anaphylaxis to proteins, fats, carbohydrates and crystalloids, and chronic digestive anaphylaxis. The order of the activity of the proteins was found to be as follows: crab, serum, casein, milk; then, less active, white of egg, beef, pork, skate, mussel, perch. Vegetable proteins had only a feeble action. Olive oil, besides giving a reaction of its own, would release a shock in animals sensitised by other substances. Antipyrine produced a stronger reaction than quinine, and a severe pruritus, a phenomenon not uncommonly seen clinically. Many animals suffered from asthma, and the authors claim that their results here and in the clinic prove the existence of an "épine respiratoire." An interesting conclusion which they draw from the results of administering horse serum, to which the animals could obviously not have acquired sensitivity, is that there is no essential difference between primary protein shock and the anaphylactic reaction. Both show a state of sensitivity, and whether this is innate or acquired is immaterial. Once the sensitivity is established, every dose of the appropriate antigen will produce a reaction, but after about three months their strength diminishes until finally they disappear; the intestinal mucosa has become immune. If, however, the meals are continued for a few more weeks, the attacks return, the reason being that the foreign substance ultimately creates lesions in the intestine and liver that constitute breaches of the natural protective barrier. The anaphylaxis is then chronic. The action of these proteins is not specific, and one will often release where another has sensitised. The severity of the reaction depends on the potency of the releasing protein. Hunger increases the reaction, and tuberculous lesions of the lung tend to force it into a respiratory form. For protection a single minimum dose, or several small doses of any protein, will give a temporary unspecific "sceptophylaxis." The intravenous method is the most effective. Prolonged administration will give first immunity, and then, after a period of months, desensitisation, and it is then possible to sensitise the animal afresh. In practice, in order to obtain immediate protection against accidents, a single dose of antigen will suffice, given by any method. If it is desired to create a more or less lasting immunity, frequent doses should be given of the particular protein to which the patient is sensitive by the path followed by the dose that caused the reaction.

[1] THE LANCET, 1926, i., 214.
[2] Über Genese u. Behandlung der Exsudativen Paroxysmen, S. Karger, Berlin, 1925.
[3] THE LANCET, 1923, i., 741.
[4] Journal de Médecine de Lyon, March 5th, 1926.

Anaphylaxis has long been considered in the light of a curious accident. The Lyon school regards anaphylaxis, idiosyncrasy, and intolerance as essentially the same thing, and has greatly enlarged our conception of this class of phenomenon.

RAT-BITE FEVER.

THE bite of a rat infected with the specific spirillum may give rise to the curious chronic relapsing fever with certain general and local symptoms known as *sodoku* in Japan, where it is very common, or more generally as rat-bite fever. The wound caused by the bite of the infected rat heals quite normally but breaks down at the end of an incubation period of usually two to six weeks, the local condition becomes that of an acute inflammation, while general symptoms soon set in. The disease appears to be fairly widespread and has been reported in this country by T. J. Horder and others,[1] but although common in Japan it does not appear to have been often recorded in China until recently. The question of its prevalence in that country is beginning to attract considerable attention, however, and a case described this year [2] by Dr. E. S. Curtis, of Funing, Fukien, is of some interest. The patient was bitten on the right index finger and too vigorous home treatment resulted in gangrene of the skin of the affected finger. With fomentations and removal of the loosened skin the condition quickly healed up, but exactly 14 days after the bite the finger again became swollen and a gland appeared in the right axilla. The temperature rose to 104° F., the patient complained of pains all over, but with simple antipyretic remedies this quickly settled down and the local condition of the finger began to subside. Ten days later a similar flare-up occurred with some lymphangitis of the dorsum of the hand, and three purplish-red erythematous patches also appeared in this neighbourhood. This acute attack again subsided, but a third flare-up occurred a week later and a fourth a week after that. Each attack lasted about two days and they got progressively slighter, the fourth one being unaccompanied by any local exacerbation in the local condition of the finger. Following the fourth attack three small doses of "914" were given and no further attacks developed. This case appears to differ from the usual description in certain details. For example, the duration of the first attack—namely, two days—was very short as compared with the usual six or eight days. Again, the purplish-red papular rash appears only to have been represented by three spots on the affected hand. The spirillum was not observed in this case, but certain features suggest that possibly the disease in China is not of exactly the same nature as elsewhere and possibly due to a slightly different organism.

SURGERY OF THE PHRENIC NERVE.

A BRIEF account of the history of phrenicotomy and of the modern radical operation for ensuring hemidiaphragmatic paralysis has lately been published in the *Journal of the American Medical Association* (March 20th). The writer, W. H. Thearle, describes evulsion of the phrenic nerve as a minor and relatively simple procedure easily performed under local anæsthesia. The possible complications and accidents associated with the operation are, he says, relatively infrequent, but he repeats the warning given by Felix against completing the evulsion in far advanced cases with extensive pleural adhesions if cardiac or respiratory disturbances reach any degree of severity. Thearle's experience is in accord with that of other observers—namely, that cough and the bringing up of sputum are made easier by the hemiparalysis of the diaphragm. He issues a warning, however, against the independent use of phrenicotomy as a curative measure in advanced pulmonary tuberculosis, and his general conclusions are summarised in the statement that "radical phrenicotomy is especially advantageous in conjunction with artificial pneumothorax and extrapleural thoracoplasty, and is the primarily indicated surgical procedure in unilateral phthisis with predominantly basal lesions." Of 62 cases treated, 35 were operated on as an independent procedure; 50 per cent. of these were improved, and 10 per cent. markedly improved.

An interesting report of a case of persistent hiccough treated by injections of novocaine into the phrenic nerve appeared in the *Indian Medical Gazette* for March. The patient was a girl and her hiccough had persisted for nearly four months, by the end of which time even ice could not be retained, and she was in a state of profound exhaustion and suffered great pain in the region of the diaphragm. Other remedies having failed, D. M. Ghose, who reports the case, infiltrated the phrenic nerves with 2 to 4 c.cm. doses of a ½ to 1 per cent. solution of novocaine. Six injections were given once daily, and apparently on alternate sides. The hiccough subsided completely and eight months later there had been no relapse. Ghose used the technique of Krogh, inserting the needle two fingers-breadth above the clavicle close to the outer border of the sternomastoid muscle, and thrusting it vertically towards the scalenus anticus for a distance of 2 to 4 cm. (according to the amount of fat). When the nerve is reached the patient complains promptly, as a rule, of transitory pain in the shoulder and region of the heart, and sometimes also in the upper abdomen. Ghose states that perineural infiltration is adequate.

A NEW TREATMENT FOR STROPHULUS.

THE troublesome ailment of infants and young children up to the age of 6 years, alternatively known as lichen urticatus or strophulus, is generally believed to have a direct relation to errors of digestion. The crops of intensely irritable papules—often associated with diarrhœa, constipation, vomiting, or other gastro-intestinal symptom—recur indefinitely, and for no apparent reason, and are especially troublesome at night. Therapeutic measures include a revision of the dietary, administration of stomachics, aperients, lactate of calcium, and bicarbonate of soda, and a variety of baths and local applications. These remedies are all useful, but lay no claim to effect a cure. The frank physician counsels patience, and assures parents that eventually their child will grow out of the trouble. The *Paris Médical*, of April 24th contains the experience of Dr. Pasteur Vallery-Radot and Dr. Blamoutier in the treatment of lichen strophulus with peptone by the mouth, and if their claims should be confirmed this treatment marks a distinct advance in therapeutics. They state that of 20 cases treated and observed for periods of from three to ten months, 10 were cured by one or two courses of ten days each; 4 were cured after a month; 2 were cured in more than a month. Of the 4 remaining, 1 reported cured after a year's treatment, 1 in 15 months, and the other 2 were lost sight of. The method is very simple and obviously harmless, but the details, say the authors, must be very strictly carried out in every case. The first point in the instructions concerns the number of meals. In infants of about 1 year they must be reduced to four in the 24 hours—viz., at 8 A.M., noon, 4 P.M., and 8 P.M. Nothing, except small drinks of water, is allowed in the intervals. The diet may consist of milk, milky foods, purées of potato or French beans, peas, and lentils, bananas (which are always forbidden in England), orange juice, and compôtes of fruit. Older children take three meals only per day: at 8 A.M., 1 P.M., and 7 P.M. Their régime may include bread, biscuits, cakes, eggs, fish, meat (except pork) once daily, sweetbreads, soups, cauliflower, tomatoes, &c. Sweets, especially between meals, are strictly proscribed. The peptone is given exactly one hour before each meal and the granular form of the product will be found the best. The time

[1] Quarterly Journal of Medicine, 1910, iii. 121
[2] China Medical Journal, February, 1926.

must be conscientiously adhered to, for it is the most vital part of the treatment. The authors advise courses of ten days of administration followed by periods of five days' intermission. The treatment should not be immediately discontinued when a favourable result has been obtained. It is advisable to prolong it for a month or two after apparent cure, and to employ in succession (*a*) a simple meat product, (*b*) a bivalent, meat and fish combination, and (*c*) one containing a mixture of the peptones from meat, fish, eggs, and milk. The methods of manufacture and the source of the peptone are not indicated in the paper.

LAMBLIASIS AND CHOLECYSTITIS.

A NEW society was founded in Italy last February under the title of "Society of Experimental Biology," with Prof. Giulio Fano, of the University of Rome, as its first president, and issues a bimensal bulletin. In the first number, published last April, Dr. C. Pappalardo,[1] of the University of Catania, describes experiments he made on five cases of cholecystitis in which he used the duodenal sound after the introduction of magnesium sulphate and examined the fluid thus extracted from the gall-bladder. In three of these cases he found mobile forms of lamblia intestinalis; in two of them van den Bergh's test was positive. The hypothesis that the parasites came from the duodenum rather than from the gall-bladder does not seem tenable, since the demonstration was conspicuous only in cases of cholecystitis and was wanting in other cases of gastric affections examined in the same way, and from the fact that the number of lamblia was approximately the same in the samples of bile A and B, while under the theory that the parasites came solely from the duodenum the first portions of liquid extracted should have shown them in greater abundance. Moreover, in view of the observation of Westphal, who in one case found lamblia even in the wall of the gall-bladder, it seems more than probable that in these cases also the parasite came from the gall-bladder. If this be admitted several possibilities suggest themselves: (1) lamblia can be the agent or one of the agents in causing cholecystitis; (2) lamblia may be an evidence of a condition favourable to the implantation of other germs, themselves the cause of the cholecystitis; (3) lamblia may be merely a harmless associate of the germs which produce the cholecystitis. The problem is a complex one and many interpretations of it are possible, but the fact remains of the noticeable frequency of lamblia in bile extracted by the duodenal sound in cases of cholecystitis and the possibility that it represents the only causal parasite. From a therapeutic point of view the cases showed the inefficacy of the usual remedies directed against lambliasis—i.e., stovarsol and repeated duodenal soundage.

CARBON DIOXIDE IN EMPYEMA.

Carbon dioxide, inhaled in a concentration of about 5 per cent., is becoming recognised as a valuable respiratory stimulus, used especially to accelerate the pulmonary elimination of poisons or drugs, such as carbon monoxide, ether, and alcohol.[2] Since the healing of an empyema is dependent on obliteration of the cavity, the clinician uses every effort to promote expansion of the lung, which is often hampered in its restorative function by the organisation of exudate on the visceral pleura and by fibrosis within itself. In a recent article[3] Dr. E. D. Churchill, of Boston, discusses the methods at present in use for encouraging lung expansion; early ambulatory régime, deep-breathing exercises, blowing exercises, and other expiratory efforts against a partially closed glottis, relief of any respiratory pain by readjustment of the drainage-tube, or, where necessary, injecting or severing the intercostal nerve. Maintenance of a negative intrapleural pressure can be ensured by repeated aspirations, clamping the tube after irrigation during a forced expiration, or the use of one of the many valvular tubes which have been described. Dr. Churchill has not found these latter satisfactory owing to the difficulty in keeping the connexion between the tube and the chest wall air-tight for any length of time. Sealing the rubber dam to the chest produces maceration of the skin, which increases the risk of secondary infection in the cavity. He now adds to these measures the use of carbon dioxide. Henderson's inhaler is left at the patient's bedside and he is instructed in its use with such exercises as are suited to his individual needs. The average convalescent inhales the gas for five minutes 15 or 20 times a day. The dizziness and unpleasant subjective symptoms often experienced in respiratory gymnastics, largely due, in fact, to the blowing off of CO_2, do not occur when this gas is inhaled. Dr. Churchill has found that the stimulation of the gas throws all the respiratory muscles into action and restores or maintains the symmetry of the thorax, whereas exercises without the gas only bring the muscles of inspiration into action during the preliminary deep breath. A tracing shows how the forced expiration produces a positive intrapulmonary pressure and the forced inspiration a negative intrapleural pressure, and the much greater regularity of the effect of carbon dioxide over blow-bottles or coughing.

THE MEASUREMENT OF X RAY DOSAGE

ON May 20th a joint meeting of the Rontgen Society and the Electro-therapeutic Section of the Royal Society of Medicine was held to hear the seventh Mackenzie Davidson memorial lecture delivered by Dr. A. Dauvillier, of Paris, who spoke on the Measurement of X Ray Dosage. The subject was fittingly chosen for an address commemorating a great radiologist, since it is one of great practical importance. At the present time many types of X ray dosimeters are in use. Most of them furnish an indication of the intensity of a beam of X rays, provided that the wave-length of these rays remains constant. In attempting, however, to compare the effects of X ray beams of different wave-length a difficulty arises with these indicators, for secondary radiations may be produced by X rays of one wave-length, but not by those of another, and most dosimeters therefore give no reliable estimate of the intensity of the respective beams. Hence the need for an international unit of X ray intensity and a standard method of measuring it has become acute and has led to the formation during the past year of an international committee to consider the problem.

In the course of his lecture Dr. Dauvillier discussed in some detail the mechanics of the action of X rays on matter. Early in the history of radiology, he said, Sir William Bragg had put forward the view that effects observed with X rays were due to the ionisation of matter irradiated by them, and time had amply verified this hypothesis. A considerable study had been made of the process of ionisation by X rays and a flood of light had been thrown upon it by the beautiful photographs of electron tracks obtained by Mr. C. T. R. Wilson. Recently measurements of the numbers of pairs of ions produced by electrons of definite speed had been made and the work done in ionising an atom had been determined. The data furnished by these fundamental investigations made it possible to gain an idea of the true absorption of X ray energy by matter and brought the absolute unit of radiation considerably nearer realisation. The concluding part of Dr. Dauvillier's lecture was devoted to the explanation of a method of measuring doses of X rays which he has evolved. He makes use of a small spherical ionisation chamber equally transparent in all directions to X rays and containing the heavy gas Xenon. When this chamber is exposed to the radiation the ionisation produced in the Xenon is about 500

[1] Bolletino della Società di Biologia Sperimentale. No. 1. 1926. Naples: Via S.S. Filippo e Giacomo.
[2] Henderson, Y., Haggard, H. W., and Coburn, R. C.: Jour. Amer. Med. Assoc., 1920, lxxiv., 783, and 1922, lxxix., 1137; White, J. C.: Arch. Surg., 1923, vii., 347.
[3] Boston Medical and Surgical Journal, April 8th, 1926.

times greater than is produced in the same volume of air and is sufficiently intense to be recorded on a micro-milliammeter. To render the indications of this instrument reliable for all wave-lengths it is calibrated against a large air-gap ionisation chamber. The use of a large chamber is necessary owing to the considerable distances travelled by the radio-electrons emitted when air is penetrated by X rays, and for correct measurement it is essential that these electrons should complete their tracks before reaching the walls of the chamber. With the help of this method Dr. Dauvillier has found that the energy per cubic centimetre required to produce an erythema of the skin is approximately 30,000 ergs.

AN EXHIBITION OF MEDICAL ART.

AN exhibition of an unusual kind is to be seen at the Baltimore Art Museum. The exhibits are the work of the department of anatomical and medical art of the Johns Hopkins Medical School. The drawings of Max Broedel, founder and director of the department, are represented by some admirable illustrations of operative technique and dissection. Of especial excellence are the water-colour drawings of human and animal embryos, magnified usually 100 diameters, by William T. Didusch. There are also included in the exhibition coloured wax models by Vladimir Fortunato. One series illustrates in ample number the progress of the conservative operation of prostatectomy by the perineal route. It is unfortunate that the later members of the series are badly lighted. This criticism, however, does not apply to a model of nodular leprosy which is a masterpiece. It is evident that the exhibition represents an experiment, and that in the future similar work may be shown to even greater advantage. Thus the director of the department of embryology has added to the exhibits in his field careful and informative descriptions of the drawings. On the other hand, the series of guinea-pig paintings from the department of tuberculosis, showing the results of intracutaneous tuberculin under various conditions, are furnished with no clue to their meaning. A guide to their scientific interest would surely not detract from the artistic value of the drawings. It may be that in the future such exhibitions will be arranged so that lovers of art may become interested in the progress and versatility of scientific medicine.

Prof. A. J. Clark has been chosen to succeed the late Prof. A. R. Cushny in the chair of Materia Medica and Pharmacology in the University of Edinburgh.

Sir John Williams, Bart., G.C.V.O., consulting obstetric physician to University College Hospital and President of the University College of Wales, died on May 24th at the age of 85.

Dr. Ernest Septimus Reynolds, consulting physician to Manchester Royal Infirmary and Emeritus Professor of Clinical Medicine in the University of Manchester, died on May 22nd at the age of 65.

Dr. Hugh Cabot, C.M.G., professor of surgery and dean of the Medical Faculty of the University of Michigan, Ann Arbor, is coming over to take charge of Sir Holburt Waring's surgical clinic at St. Bartholomew's Hospital from Monday, May 31st, until Saturday, June 12th. During this time he will deliver four lectures in the Medical School—viz., Wednesday, June 2nd, at 12.45 P.M., Non-tuberculous Infections of the Kidney; Friday, June 4th, at 4.30 P.M., a second lecture on the same subject; Wednesday, June 9th, at 12.45 P.M., The Present Position of Prostatic Surgery; and Friday, June 11th, at 4.30 P.M., Tuberculous Disease of the Kidney.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CLXXIV.

THE TREATMENT OF PERIURETHRAL ABSCESS.

FROM a clinical standpoint periurethral abscess may be divided into two classes—those associated with the penile and those with the bulbous urethra.

Penile Periurethral Abscess.

The first class of case is comparatively simple. The abscess arises in an infected follicle of Littré, as a complication of acute (rarely chronic) urethritis. A tender induration can be felt on the under surface of the penis. Left to nature the abscess frequently bursts externally, and a urinary fistula may result. Early incision per urethram is the best method of abruptly terminating these untoward possibilities. The operation is satisfactorily carried out under gas anæsthesia. The help of an aëro-urethroscope is desirable, but if the abscess is near the meatus, as it usually is, it may be dealt with by inserting a tenotome down the urethra.

Uncomplicated Bulbar Periurethral Abscess.

By "uncomplicated" it is meant that there is neither acute retention nor extravasation present. In the majority of cases the abscess occurs behind a stricture of the bulbous urethra. This is a much more serious condition than the penile abscess considered above, for *bulbar periurethral abscess is the commonest cause of extravasation of urine.*[1]

Under general anæsthesia, with the patient in the lithotomy position, an incision is made in the perineum exactly in the middle line. There is frequently much induration around the walls of these abscesses, and one has to proceed to what appears to be some considerable depth before striking the pus, which, as often as not, is quite small in amount. The after-treatment consists in daily irrigation of the perineal wound with eusol through a Higginson's syringe, and the patient is encouraged to sit in a sitz bath for at least half an hour twice daily. When the inflammation has abated and the perineal wound looks quite clean—usually in about ten days time—the renal function is tested, and if this is found to be satisfactory the stricture of the urethra receives attention. Occasionally it is possible to dilate the stricture with bougies, but in my experience these cases usually require an internal urethrotomy. A catheter is then tied in. This allows rapid closing of the perineal wound. The catheter is changed every fourth day until the perineum is soundly healed. Throughout the after-treatment a mixture containing sodium acid phosphate gr. xxx. is given three times a day with urotropin gr. x. Before the patient is discharged he should be warned that the stricture requires regular dilatation. The end-results of the treatment of this condition are gratifying.

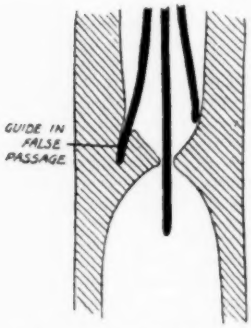
Periurethral Abscess with Extravasation.

A periurethral abscess with extravasation represents a later stage of the condition described above. The general condition of the patient is usually grave. Oft-repeated rigors are the rule and may mislead the casual diagnostician. A local examination rarely fails to reveal the true nature of the condition. There is the obvious swelling in the perineum, the scrotum is infiltrated, and later the extravasation spreads up on the abdominal wall. The cellular tissues of the penis are involved about this time, and the condition rapidly passes on to gangrenous cellulitis. Sir Benjamin Brodie noted that a black patch on the

[1] Bailey and Huddy: Brit. Jour. Surg., 1924, xii., 183–191.

glans penis was a harbinger of death. In all probability the patient has had more or less complete retention of urine for some days, and he is definitely uræmic. The grave general condition is due to combined septicæmia and uræmia. Nevertheless, it is astonishing what a large percentage of almost hopeless-looking cases will recover with prompt and careful treatment. On account of the uræmia a general anæsthetic is contra-indicated. I believe that the routine use of intrathecal stovaine has done much to reduce the mortality.

FIG. 1.



The "faggot" method of passing bougies.

The following procedure has given most satisfactory results. The urethra is washed out and an attempt is made to pass a bougie into the bladder. Great gentleness must be exercised, for the inflamed urethra is easily perforated. It is usual to be able to pass a No. 3 or 4 French bougie. In the absence of an instrument by which the bougie can be passed under direct vision the "faggot" method (Fig. 1) is of distinct value. This method consists in passing a second, third, and even a fourth bougie down the urethra alongside the first; by trying each in turn, one of the number is gently coaxed through the stricture. If the stricture is impassable Wheelhouse's operation must be performed. If the bougie has been passed (and this is possible in the majority of cases) it should be fixed in position. The patient is now put in the lithotomy position and a sandbag placed under the sacrum effectively exaggerates this position. Lane's tissue forceps are clipped upon the most dependent part of the infiltrated scrotum. These serve as scrotal retractors. By this method the scrotum is pulled up and the perineum clearly exposed to view. An incision now is made, strictly in the middle line, from the base of the scrotum to within half an inch of the anal verge. The incision is deepened until the abscess is opened. A finger is now passed into the wound and the bougie within the urethra is sought for by palpation. The floor of the urethra is next incised on to the bougie. The left index finger is passed into the dilated urethra with the pulp against the bougie. The finger is thus guided into the bladder. A large coudé catheter is then passed through the incision along the index finger into the bladder and secured to one side of the wound by a stitch.

Drainage of the Cellular Tissues.—The left forefinger is now passed through the perineal wound upwards and outwards, clearing the crus penis, and made to protude subcutaneously above and to the outer side of the symphysis pubis (see Fig. 2). The skin is then incised over the finger and drainage-tubes, with lateral perforations, are inserted as shown in the diagram.

Incisions into the Infiltrated Tissues.—In contrast with older methods fewer, but larger, incisions are recommended. There is a tendency on account of the infiltration for these incisions to be too superficial; they must penetrate the limiting fasciæ. If time permits hydrogen peroxide can be injected hither and thither into the infiltrated tissues by means of a Record syringe fitted with an aspirating needle, for it has been shown that the organisms in the exudate are mainly anaerobic.

Dressings.—Dressings soaked in eusol are applied over the abdominal wall, perineum, and scrotum. These are covered over by packing towels, and the whole is secured by a T-shaped bandage.

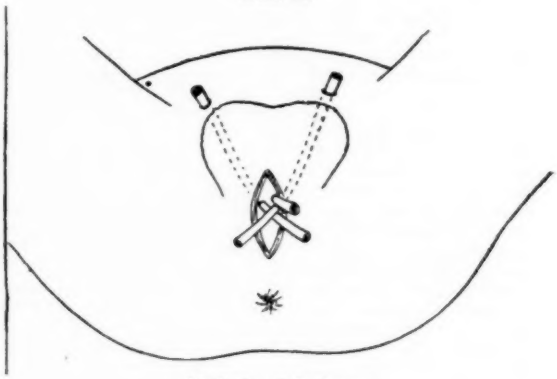
After-treatment.

During the first 24 hours the patient is encouraged to drink as much fluid as possible. Rigors are usual during this period and are most satisfactorily combated by hot gin and quinine. The catheter is removed at the end of 48 hours. Every four hours all the wounds are irrigated with eusol, after hydrogen peroxide has been instilled for a few minutes. As soon as the general condition permits, sitz baths are instituted, and throughout the convalescence the sodium acid phosphate mixture is prescribed in liberal doses.

A *residual abscess* is frequently seen in the flank, just above the anterior superior iliac spine, and should be opened under gas anæsthesia.

When the infection has subsided, which is usually in about a month's time, the stricture should receive appropriate attention, as outlined above. Very great care must be taken to investigate the functional activity of the kidneys before undertaking the treatment of the stricture. A weekly blood-urea estimation during convalescence from the acute stage will indicate when the time is ripe for the second operation. The patient should not be discharged until the perineal wound is soundly healed. The long illness usually completely undermines the morale of these patients, and the weekly dilatation of the urethra becomes to them an ordeal of very considerable magnitude. The necessary dilatation calls for much tact and gentleness on the part of the surgeon. An instillation of 2 per cent. borocaine for five minutes before instrumentation goes a long way towards making the procedure painless.

FIG. 2.



Methods of drainage.

HAMILTON BAILEY, F.R.C.S. Eng.,
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LIVERPOOL: NEW MATERNITY HOSPITAL.—The first part of the new maternity hospital is now ready for use and has been open to public inspection for three days. There has been a steady flow of visitors who acquired a link with the institution which it is hoped they will never forget. The first part, which is roughly one half of the intended whole, contains 54 beds arranged in prenatal, labour, and post-natal wards. The labour ward and operating theatre block forms one well-designed unit with anæsthetic, sterilising, and scrubbing-up rooms common to both parts. Lighting is admirable, one half of the large theatre being designed chiefly for use by day, and the other for times when artificial illumination is required. The wards are intended to accommodate only eight patients each and they have nurseries attached. A number of single-bedded rooms suitable for special cases is also provided. As an integral part of the hospital there is a large out-patient department with separate and well-equipped examination rooms, an antenatal clinic, and the central branch of the Maternity District Nurses' Home. The administrative offices, nurses' home, and resident medical officers' quarters are, of course, complete, and are modern and attractive. The whole of that portion of the hospital which is now complete is to be known as the Sir William Hartley Memorial Wing in acknowledgment of the generous bequest to which the new hospital largely owes its existence.

Special Articles.

ADVICE UPON DISINFECTANTS AND SICK-ROOM DISINFECTION.

BY HENRY R. KENWOOD, C.M.G., M.B. EDIN., L.R.C.P. LOND., D.P.H.,
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Some General Considerations.

WHEN practicable, infection should be destroyed as near as possible to the fountain-head—the infectious human being. When the virus is contained only in the evacuations this is practicable; when it is given off from the nose and throat or skin it is impossible to achieve more than partial success, and the infection becomes disseminated throughout the room.

Although complete disinfection of an infected sick room is not possible until the sufferer is no longer a source of infection, there are obvious advantages, from the standpoint of the patient and nurse, in keeping down the infective elements in the room during the whole of the infectious period. With this object in view discharges from the mouth, nose, &c., may be collected by means of paper or rags and promptly put into the fire which is so desirable in every infectious sick room, before they can become dry, and much infection of the sick room may be collected and removed daily by damp sweeping and dusting.

In the destruction of infection we have not, in practice, to deal with naked organisms. They are always associated with more or less organic matter which itself may impede, reduce, or destroy the agent employed. Hence there must always be a time exposure to the disinfectant, and the agent employed must possess a permanence in action for at least 20 to 30 minutes. The handicapping effect of the medium in which the germ is embedded and the resisting power of different germs may vary considerably, and so knowledge and care are necessary in the selection of an agent which will meet all practical purposes.

Those disinfectants which by giving up oxygen soon expend themselves upon the dead organic matter are inferior to those which have a greater permanence of action and exert a selective effect upon the living organisms. Chlorine, potassium permanganate, and Condy's red fluid (a mixture of the permanganate and sulphate of soda) are oxidising agents, and chlorine loses strength under the ordinary conditions of use. The perchloride and the iodide of mercury, and the higher homologues of phenol, kill by their combination with the albumin of the organism and by their toxic effect, and they represent the most effective of the liquid disinfectants.

The strength at which a disinfectant is employed will depend upon two considerations: the resistance of the organism to be destroyed, and the amount and nature of the diluting material to which it is applied. Especially is it important to bear in mind the last-mentioned factor. Suppose, for instance, that a disinfectant is germicidal in 15 minutes when made up to a strength of 1 : 200; if this dilution is added to an equal quantity of urine the strength of the disinfectant will then be 1 in 400, and disinfection cannot be secured. Therefore agents added to liquid or solid matter must be made up to at least twice the strength employed for other purposes in order to ensure that after admixture they are not diluted to below their killing strength.

For every purpose it is best to employ either a liquid disinfectant or heat. Powders, gases, and vapours are less effective. Heat is a most valuable disinfecting agent. Infected articles that can be kept in boiling water for 20 minutes are thereby efficiently disinfected; but when this method is applied to bed and body linen stained with albuminous matter, such as blood or fæces, the stains should be removed by soaking in cold water and rubbing if necessary with a little soap, prior to placing them in the boiling water. Steam stoves are employed by local sanitary authorities for disinfecting mattresses, pillows, clothing, &c. This is found to be the most satisfactory way of securing the rapid penetration of heat sufficient for disinfecting purposes.

The mercury salts suffer from the drawback that they are very poisonous to human beings, and being colourless and non-odorous in solution may be mistaken for water; they attack and damage metal receptacles, and they precipitate albumin which may serve to shield micro-organisms. This precipitating effect can be greatly reduced, however, by acidulating the solution; ½ oz. of the perchloride, 1 oz. of hydrochloric acid, and 1 gr. of aniline blue to 3 gallons of water is a valuable disinfectant solution containing 1 : 1000 of the perchloride.

Phenol (carbolic acid) was formerly much employed for disinfecting purposes at a 5 per cent. strength, but it has been replaced largely by agents containing the higher homologues of phenol. They are mostly made up as emulsions. Two of the oldest of these agents are the well-known "Izal" and "Cyllin," which, like others now upon the market, are far less toxic, and being many times more powerful, are cheaper in use than carbolic acid; moreover, their odour in the sick room is, generally speaking, far more agreeable to the occupants.

Choice of a Liquid Disinfectant.

Disinfectants containing higher homologues of phenol are to be preferred. This I say because they are the only agents which I know of which combine a high germicidal value with permanence of strength and low toxicity to human beings. Such agents should be put up in the form of a fine emulsion which remains stable under the conditions of use; for hard waters and urine accelerate de-emulsification in unstable emulsions, and an agent with its emulsion impaired may be almost, if not quite, valueless in practice.

The percentage of the higher boiling tar acids, the fineness of the emulsion, and its permanence when mixed with urine should therefore be the great determining factors in making a choice, and so great importance should be attached to physical tests designed to determine whether the emulsion "stands up" well in urine or sea-water, or tends to separate out, from any other cause, on keeping for a reasonable time, whether in bulk or after dilution. The stability of the emulsion may be determined by sight and by comparing the specific gravity of portions removed at different levels.

In addition to the above considerations, evidence should be required from workers of repute upon the relative powers of such agents against several pathogenic organisms (including those of typhoid and tubercle). If such tests have been applied to the germs in the presence of the organic matter with which they are commonly associated, I should not then expect a high germicidal power, but the agent with the highest efficiency under the test conditions should be selected.

The above considerations being favourable to more than one agent, my choice would fall upon the one which does not in any way injure the metal or other surfaces with which it may be brought in contact; is the least poisonous to the higher forms of animal life; and which possesses the maximum deodorising effect. I should also have regard to diffusibility and power of penetration, for especially is the wetting power when applied to dust an important factor when the agent is employed for spraying. This wetting power depends on surface tension, complicated, maybe, by surface concentration, preventing the running together of the liquid to form drops. A disinfecting agent in the form of a colloidal emulsion has, in dilute solution, a surface tension of half that of water, whereas the surface tension of, say, a solution

of sodium hypochlorite is higher than that of water, and so has a relatively poor wetting power. Mercuric chloride solution and formalin can only wet dust with difficulty. We should be mindful of the fact that a low-grade disinfectant is always an uneconomical purchase. No one, for instance, at the present day with any knowledge of disinfectants would dream of purchasing carbolic acid, seeing that agents far more powerful, less toxic, and more pleasant in use, are procurable.

Whilst, then, the power and stability of emulsified disinfectants containing the tar acids depend on the nature of the disinfectant oil, the emulsifying material, and the fineness of the emulsion, they are also dependent upon the nature of the organic matter and the water with which the disinfectant is required to mix in practice. Natural waters, urine, fæces, and organic fluids generally contain electrolytes—such as the salts of calcium, magnesium, sodium, and potassium. Soap is precipitated by electrolytes, and therefore it follows that a low grade coal-tar disinfectant, which is a mixture of creosote oil emulsified by the aid of soap, is de-emulsified to a greater or lesser degree on admixture with most natural waters and organic fluids.

The phenomenon of surface adsorption explains how a considerable concentration of disinfectant can be produced on bacteria when they are immersed in even a very dilute solution, and how a liquid of little solubility in water may in a colloidal state exhibit a greater germicidal activity than a true solution at equal concentration. A semi-liquid colloidal layer saturated with the disinfectant is adsorbed on the surface of the disinfectant oil globules. Mutual attraction exists between the oil globules and the organism owing to the fact that they carry opposite electrical charges, and the oil droplets being so minute exhibit Brownian movement. The germicidal activity of a disinfectant oil globule being concentrated at its surface, the extreme importance of maintaining a very fine division of the oil, presenting the largest possible surface area to micro-organisms, is obvious. The bacteria, which are larger than the mean diameter of the emulsified particles, are continually bombarded by the latter, and are thus frequently brought into intimate contact with the globules of disinfectant oil.

How a Liquid Disinfectant Kills.

A few years ago Dr. Harriette Chick, in a valuable communication upon the subject, advanced the view that the killing of germs by chemical disinfecting solutions follows the laws of chemical reaction. I am not satisfied with this explanation for several reasons, one being that a disinfectant oil to which is added less soluble oils, less chemically active and less poisonous, may acquire a higher germicidal value.

If the killing of germs is entirely a chemical action it must operate by virtue of the fact that substances which act as protein precipitants and protein poisons kill bacteria. But carbolic acid precipitates proteins, and we should expect carbolic acid to be more active than the higher boiling tar acids, owing to its greater solubility and penetrating power. We find the reverse to be the case. Therefore I believe that chemical action is not alone concerned, and that electrical action plays a part. As is now well known, most bacteria in fluid media carry a positive charge of electricity. It has been proved that a colloidal solution of china clay, a substance chemically inert, the particles of which carry a negative charge, will act as a disinfectant, and the assumption is that the negative and positive particles mutually discharge each other and the bacillus is killed. Emulsions of tar acids, which we may view as colloidal mixtures with oil as the disperse phase and water as the continuous phase, may be expected to carry on the oil particles a negative charge.

Minute particles of dead organic matter probably carry a positive charge, and this is likely to be one of the reasons for the lowering of germicidal value in the presence of organic matter. Thus high coefficient disinfectants have a double action. We have small particles of oil carrying an electrical charge; this charge will kill naked organisms, but anything in the dilution which tends to dissipate this charge, such as organic matter, mineral particles, or a large number of bacteria, will lower the coefficient. There is also a chemical action due to the semi-soluble tar acids; the disinfectant action of this portion is more permanent and is only affected by substances which combine directly with tar acids, such as protein material.

Perhaps the nature of germicidal action is, in order of importance, (1) chemical, (2) physical, and (3) electrical.

Just a few words upon the selection of the agents and methods best designed for certain particular purposes.

The *fæces*, or other *discharges* from the infectious sick, should be covered with a disinfectant solution of twice the strength employed for most other purposes. The acid solution of perchloride of mercury (1 : 500) or disinfectants containing the higher homologues of phenol (1 : 100) can be recommended. Contact must be maintained with the disinfectant and the discharge for half an hour, when the whole may be emptied down the w.c.

Sputum is difficult to disinfect by means of liquid disinfectants, because some of it is often of a nature which prevents penetration, and therefore it is best either to burn or boil it, when it cannot be put down a w.c.—as would be the case in most country cottages.

The Hands.—It is advisable for the nursing attendant to protect the hands by thin indiarubber gloves, because the *complete* disinfection of hands is difficult and tedious. Failing the protection of gloves the infected hands should be first thoroughly scrubbed with soap and hot water, using a nail brush assiduously; then further scrubbed and soaked in absolute alcohol for five minutes; and finally steeped in a solution of 1 : 500 of the iodide of mercury dissolved by means of iodide of potassium.

Handkerchiefs, *Pillow Slips*, *Sleeping Garments*, and *Sheets* can be disinfected in the sick room prior to their removal for laundry purposes by soakage in a liquid disinfectant for half an hour. Here a disinfectant containing one of the higher homologues of phenol (1 : 200) is to be preferred. The precaution indicated above with reference to any albuminous stains must not be omitted, and at the end of the half hour the articles can be wrung out of the disinfecting solution and removed from the sick room, and even sent to a public laundry, if desired.

At the termination of the infection the surfaces of the sick room may best be disinfected by the use of an extremely fine spray or atomiser by which a liquid disinfectant can be directly applied, followed by the washing of all the *horizontal* surfaces (upon which most infection lodges) with soap and water to which disinfectant has been added. The fumigation of an infected sick room is a less efficient measure.

The final disinfection of a sick room will always include the disinfection of bedding, and frequently the disinfection also of clothing, curtains, carpets, books, &c., and sometimes the stripping of wall-papers. All this can be done satisfactorily only by the local sanitary authority provided with the necessary apparatus and trained worker. A note to the local medical officer of health will secure this service, free of charge, in almost every district.

Dead infectious bodies should be wrapped in a sheet kept moist by a liquid disinfectant containing a higher homologue of phenol (1 : 200) or perchloride of mercury (1 : 1000).

The Value of Chemical Disinfectants.

Although the value of disinfectants is not disputed by anyone, the value of the disinfection of rooms and their contents after scarlet fever and diphtheria, as generally carried out, has been questioned in recent years. I have elsewhere expressed the view that

prolonged inquiry is necessary to get at the truth, which is elusive and difficult to arrive at, and that the inquiry must embrace many very carefully ascertained facts.

All those who have studied with an open mind the rather crude observations which have been published will agree that it is impossible at the present day to come to any safe conclusion upon the problem which they seek to solve; and that meanwhile we are not justified in denying to the public a measure of probable protection. By availing ourselves of suitable agents and methods of disinfection it is certain that we can achieve much superior results to those which can be secured by "spring cleaning." That fact can admit of no doubt, for its truth can be demonstrated quite easily.

The Sale of Disinfectants and the Public Interests.

If there were in this country a deliberate conspiracy to discredit disinfectants as useful weapons with which to fight the germs of disease, that circumstance alone could explain the following facts.

Any agent may be puffed as a disinfectant and false claims may be made as to its powers. In the United States of America both the public and the producers of really good class agents are protected by the seizure of stocks and infliction of fines whenever there is misrepresentation. The general public is voiceless in such matters, but the best elements of the trade in disinfectants have called for such protection. It is in the public interest that this should be afforded, and a resolution to this effect was proposed and carried at both the Birmingham Congress of the Royal Sanitary Institute (1920) and the Congress of the Royal Institute of Public Health at Brussels (1921). That resolution was circulated to all county borough councils by the Royal Sanitary Institute, and it was endorsed by a large majority of these councils, not a single council having anything to say in disapproval.

The sale of relatively poor and inefficient agents is fostered by the conditions imposed upon the sale of disinfectants. Under the Poisons and Pharmacy Act, 1908, all of those disinfectants which contain over 3 per cent. of carbolic acid or its homologues must be labelled "poisonous," and may only be sold by chemists. But comparatively useless agents of feeble disinfectant value, containing not more than 3 per cent. of carbolic acid or its homologues, need not be so labelled, and may be sold at oil and grocery shops and stores. Therefore the Act tends to favour the sale of the low class disinfectants, for the public buy far more disinfecting material from oil and grocery shops and stores than from chemists.

HELIOTHERAPY IN THE U.S.A.

(FROM AN OCCASIONAL CORRESPONDENT.)

IT was not until the winter of 1913 that heliotherapy was seriously undertaken in the United States, although occasional experiments with the sun cure had been made, especially in the south-western States before that time. But in that year the late Dr. John H. Pryor came back to this country full of enthusiasm for the excellent results which he had seen at Leysin. His enthusiasm was needed, for the idea of heliotherapy was not readily accepted by American surgeons whose technique had then just reached a height of perfection that was a remarkable advance on the methods of a previous generation. In spite of difficulties Dr. Pryor built up at the J. N. Adam Memorial Hospital at Perrysburg, N.Y., a fine and successful institution. Dr. Horace Lo Grasso, the present director, gave an interesting account of the results achieved up to the beginning of this year when he addressed the School of Hygiene of Johns Hopkins University on April 12th.

The records do not include patients who failed to remain for three months in the institution. This is a reasonable limit considering that the average duration of illness before admission is about two and a half years. Up to Jan. 1st, 1926, 1034 patients had been discharged who had resided for three months or longer. The attached table shows the results

Results of Heliotherapy at Perrysburg, N.Y., to Jan. 1st, 1926.

—	Total cases	Apparently recovered	Arrested	Improved	Unimproved	Dead
Lymph nodes	468	381 (81·4)*	48 10·2)	28 (6·0)	6 (1·3)	5 (1·1)
Peritoneum	107	82 (76·6)	14 (13·1)	3 (2·8)	8 (7·5)	— —
Bone and joint	324	182 (56·3)	80 (24·6)	30 (9·2)	22 (6·8)	10 (3·0)
Non-tuberc. osteomyelitis	33	15 (45·5)	9 (27·2)	9 (27·2)	— —	— —
Tuberc. kidneys	42	9 (21·4)	18 (42·7)	10 (23·8)	4 (9·5)	1 (2·4)
Epididymis	13	6 (46·1)	5 (38·4)	2 (15·5)	— —	— —
Eyes	21	19 (90·5)	1 (4·7)	1 (4·7)	— —	— —
Skin	5	4 (80·0)	1 (20·0)	— —	— —	— —
Empyema	15	7 (46·6)	— —	6 (40·0)	1 (6·7)	1 (6·7)

* Figures in parentheses are percentages.

achieved in the various groups. Three of the 17 deaths resulted from influenza during the epidemic, one was the result of a psoas abscess which ruptured into the peritoneum and the remainder were all cases which had advanced pulmonary disease. Fourteen per cent. of adults and 21 per cent. of children had multiple lesions, while 69 per cent. of adults and 16 per cent. of children had a "diagnosable" pulmonary lesion.

Dr. Lo Grasso thinks that Rollier's attitude towards surgical interference is too conservative. He himself recommends the use of the knife for removal of sequestra or of a kidney where there is advanced disease in one kidney only. He hesitates, however, to resort to surgery until sunlight alone has been given a good trial. He is prepared to qualify also Dr. Rollier's dictum that those do best who tan most readily. Though he has found this rule to be true in general, still there are those who show very little tan yet improve markedly. It would be more nearly in consonance with his experience to say that those do best who most nearly approach their own limit of pigmentability.

During the summers of 1922 and 1923, 100 cases of uncomplicated pulmonary tuberculosis were treated with heliotherapy by way of experiment. No hæmoptyses were observed, although some of the cases had previously had hæmoptysis and one case had been bleeding only a week before treatment commenced. Dr. Lo Grasso believes that pulmonary cases respond well to this treatment and may safely take the sun cure if the necessary precautions are observed. These include gradual exposure, beginning from the feet (an excellent chart for this purpose has been printed by the institution), avoidance of the hot midday sun in summer and of cold draughts in winter, and no sun treatment for one hour before and two hours after meals. Cases with nephritis or with much emaciation must be treated very cautiously to avoid chilling.

Dr. Lo Grasso has not been able to obtain equally good results by the use of lamps. Some improvement may be observed, but the remarkable growth of muscle tissue that is observed with heliotherapy is never noticed in treatment by artificial light. The tanning which the ultra-violet from artificial sources produces is, he claims, different from that produced by sunlight. It is possible to distinguish the skin tanned by sunlight with one's eyes closed, so characteristic is its smoothness of texture. No doubt the air-bath plays a large part in the success of heliotherapy.

Baltimore, April 16th.

MEDICINE AND THE LAW.

Professional Discipline—the Right of Appeal to the Courts.

IF a solicitor has been excluded from professional practice by order of the Law Society, he has a statutory right of appeal to the law courts. If a medical practitioner is removed from the Register he has no such right. Some critics have thought that this is an omission which should be remedied; it may, therefore, be worth while to notice how the right of appeal operates in the case of solicitors. The Law Society not long ago ordered a solicitor to be suspended from practice for six months. He had been out riding, and at 2.45 in the afternoon he called at a working men's club and asked for a glass of beer. He was told by the steward that he could not be served as the permitted hours had just expired. He then went up to the chairman of the club, who happened to be on the premises, and gave him a blow or a push, using unbecoming language. The occurrence was undoubtedly indecorous, but, when the solicitor was summoned for it at the police court, he received no heavier penalty than a fine of £2 and an order to pay £2 costs. The Law Society thereupon held an inquiry and suspended him as already stated and he appealed from the Society's order to the Divisional Court. His appeal was dismissed. The judges, even though the Solicitors Act gives a right of appeal, are evidently as unwilling to interfere with the jurisdiction of the Law Society as they have been reluctant to revise the decisions of the Medical Council. The Lord Chief Justice remarked that Parliament had deliberately made the Law Society master in its own house. The case was evidently one for the judgment and good sense of the Professional Committee, and there was not the slightest ground for thinking that they had misdirected themselves. The law courts, one may add, have always exercised a somewhat special jurisdiction over solicitors, for solicitors are officers of the Supreme Court; moreover, judges might well be thought to have expert knowledge of the standards which should be observed in the legal profession. Yet the Divisional Court refused to take the matter out of the hands of the Law Society and did not even call upon the latter to argue its side of the case.

Let us suppose for a moment that the case had concerned a doctor instead of a solicitor. The doctor, if similarly sentenced, would have had no right of appeal as a matter of course. He would have had no access to the law courts unless he could allege that the professional tribunal had been guilty of bias or that the proceedings had somehow been tainted with irregularity. But the solicitor's case which we have just described seems to indicate that an appeal to the law courts, where the right of appeal exists, is not likely to prosper unless there is some flagrant irregularity or misdirection. Any lawyer who has studied the cases decided by the General Medical Council in recent years would be slow to believe that, if a right of appeal to the law courts had existed under the Medical Act, the judges would have upset the tribunal's decision on any single occasion. The existence of a right of appeal to the courts may be reassuring, but those who advocate that such a right should be conceded must not expect too much of it. The judges would, no doubt, say of the General Medical Council—as they have said of the Law Society—that Parliament deliberately intended it to be master in its own house.

Workmen's Compensation—the "Odd Lot" Man.

If a workman has been so seriously injured by an accident that his value in the labour market is gravely diminished, the employer can sometimes find him light duty within his capacity; if so, the workman can still earn wages and thus the maximum compensation need not be paid. But if, owing to bad trade, the employer cannot find the man an odd job of light duty, what is the position? This was the question answered by the Court of Appeal lately in Palmer *v.* Crawshay Brothers (Cyfarthfa) Ltd., a case reported in the *Times* on April 29th. A collier was seriously injured in 1915 in a shot-firing accident; he lost his left eye and his right eye was badly damaged. In 1923 he was given light duty as a watchman guarding coal stocks, but he was assaulted by thieves and was further incapacitated. After medical examination a year ago his compensation was reduced to 8*s.*, but on appeal to the county court it was raised to 10*s.* The judge said the man was so seriously incapacitated that nobody was likely to employ him except his former employers. He would have awarded the maximum compensation if the employers failed to find the workman suitable employment; he considered, however, that the applicant's right to recover compensation was, in view of the nature of his injuries, affected by labour conditions, there being much unemployment in the district. The Court of Appeal has now decided that the county court judge was wrong in taking the current labour conditions into account. The man was an "odd lot" case, and came within the dictum expressed by Lord Justice Moulton in Cardiff Corporation *v.* Hull in 1911. "Odd lot" men are workers who after an accident are left incapable of average capacity in any well-known branch of employment, men who are fit only for special uses and whose powers of work are not a merchantable article in some well-known line in the labour market. When a man is in that category, said Lord Justice Moulton, it is incumbent on the employers to show that he can, in fact, obtain the special employment which is all that he is fit for. The "odd lot" man, in fact, is totally incapacitated unless his employers can find work for him. Adopting this view, the Court of Appeal awarded the collier the full amount on the basis of total incapacity—i.e., 29*s.* 9*d.* per week.

Injury from Hair-Dye.

Another purchaser of "Inecto" hair-dye has been awarded damages for injury attributable to its application. According to her counsel the dye caused sores on the head, a progressive rash, swelling, affection of the heart and nerves, and permanent disfiguration. It was admitted by the proprietors of "Inecto Rapid," who were the defendants, that their hair-dye had unfortunate effects for some customers whose skin was by personal idiosyncrasy specially susceptible. It was argued, however, that the dye was accompanied by instructions, that the instructions said a test was necessary before using the dye, that the plaintiff, though she had read the instructions, chose to ignore the test, and that therefore she was negligent in applying the dye, had brought the whole trouble upon herself, and was alone responsible. The jury awarded her £500 plus a further sum agreed as special damage. Dr. B. M. Footner, consultant to the defendant company, used the phrase "Inecto dermatitis" which he claimed to have coined. It is, of course, the misfortune of the defendants in such a case that others are known to have suffered similar injuries and to have recovered damages on that account. Whether the hair-dye caused injury in a particular case and whether the vendors gave adequate warning of the danger (if danger there was) in the application of the dye, are pre-eminently questions of fact for a jury to decide.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Protective Value of Anatoxin.

Lereboullet, Boulanger-Pilet, and Gournay have tested the Ramon antidiphtheritic vaccine, anatoxin, in about 2000 children. Two injections given three weeks apart were effective in 95 per cent. of the cases and the addition of a third injection raised the success rate to 100 per cent. Anatoxin produces practically no local or general reactions, especially in children aged less than 8 years. It should be used particularly in children of 1 or 2 years old, because they are

so susceptible to diphtheria, and as it seems to be in increasing demand by French families, the number of hospital cases of diphtheria is expected to diminish. Roubinovitch, Loiseau, and Lafaille have investigated the duration of immunity produced by anatoxin in children vaccinated in 1924 and re-examined 12 to 25 months later. Two injections proved necessary as a routine to assure immunity continuing for one to two years. A single injection, however, gave protection of this duration in about two-thirds of the cases. In a few cases three injections were required to immunise the patients for two years.

Hospitals and Sickness Insurance.

The Chauveau Report, which has just been presented to the Aid and Hygiene Committee of the French Senate, deals with the relations between insured persons and the hospitals. It does not, however, solve the vital question which is exercising the minds of those responsible for the large public hospitals and of teachers of medicine and surgery. The legislation governing sickness insurance allows every insured person to choose his own physician, and the result is that many patients are sent to private sanatoriums or nursing homes. There is a danger that there will be such a falling-off in admissions to the great hospitals that medical teaching will become difficult. This tendency is especially obvious in Alsace. Prof. P. Merklen, writing in the *Presse Médicale*, says that the existing laws on sickness insurance will prove to be boomerangs and opposed to real humanitarianism. These laws are being combated by the national federation of French medical unions (syndicats), which are also uniting to protect physicians against the undermining of their positions, rights, and privileges by undue socialisation of any kind.

Legislation on Occupational Accidents.

Occupational injuries are at present subject to a law of 1898 which permits injured employees to select their own physicians. This law, however, puts professional fees so low that physicians and pharmacists not infrequently ask employees for sums exceeding the officially stated allowances for which the employer is liable. Growth of this practice is tending to limit the employee's free choice of a physician, and it is therefore proposed that the existing regulations shall be modified by changing the official tariff.

Hospital Personnel and Professional Risks.

The official French charities organisation, the Assistance Publique, is considering the question of providing pecuniary protection and indemnities for hospital interns exposed to infection and other professional risks. The only occupational classes not provided for by French legislation have been the medical, surgical, nursing, and other personnel of hospitals and the members of university faculties. The indemnities being discussed refer to allowances for partial or total disability and to pensions for widows and orphans. Disability percentages will probably range from 5 to 100 per cent. This new legislation is to operate as an addition to the present law of March 31st, 1919.

Students' Demonstrations at the Faculté de Médecine.

On account of the fact that Prof. A. Prenant, who holds the chair of histology, gave evidence at the trial of Clerc and Bernardon, who were concerned in a communist murder of the rue Damrémont, certain student groups made such vigorous demonstrations during Prenant's courses that he was unable to go on lecturing. All courses and examinations in histology were officially suspended and this inflicted great hardship on many innocent students. The secretary of the Students' Association has taken up the matter and guarantees the obedience and courtesy of the students, so that the affair bids fair to end in harmonious resumption of lectures and examinations.

Inauguration of the American Hospital.

The new and admirably equipped American hospital at Neuilly was formally opened on May 12th. At the ceremonies the American Ambassador presided, and addresses were given by the President of the French Republic, Marshal Foch, and others.

At the Paris Medico-legal Society, Desfarges recently reported a case of suicide by dial poisoning. Seventy-one tablets were taken, but the quantity of dial per tablet is not stated. The symptoms of intoxication were delayed because the tablets were swallowed without liquid of any sort, but treatment in hospital did not ameliorate the fatal coma. In France the sale of most hypnotics is unrestricted.

The Eleventh French Congress on Legal Medicine will be held from May 27th to 29th. Questions to be discussed include the diagnosis of drunkenness, determination of alcohol in the blood, physicians' depositions and oaths, testimony offered by psychopaths, traumatic arthritis, and the pathology of traumatism.

The Thirty-fifth Congress of the French Surgical Association will be held from Oct. 4th to 9th. The special subjects will be the pathology of the meniscus of the knee, conservative operations in inflammatory adnexal lesions, and the treatment of progressing gonococcal arthritis.

A vacation course on Diseases of the Liver and Pancreas, including Diabetes, will be held from June 28th to July 9th at the Clinique Médicale de l'Hôtel-Dieu. The course will be essentially practical and will be directed by Prof. Maurice Villaret. Particulars may be had from the secretary of the Faculté de Médecine.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Domiciliary Care of the Insane.

AT a recent meeting of the Royal Medical Society Prof. Rudolf Fabinyi said that there was no greater need in the treatment of mental disease than for the proper nursing and supervision of insane persons outside hospitals and asylums. The majority of the insane, including psychopaths and imbeciles, could be kept within their own families, and this arrangement made nursing more pleasant, and permitted the patients to earn their living whenever they were able. Supervision in the home, he said, relieved the public purse by reducing the number of institutions needed; it safeguarded the public safety; and it was also of some prophylactic value, since care could be extended to those who had never been inmates of institutions, to those who had early symptoms only, and even to those who had merely a tendency to mental trouble. In some of these cases disease might be prevented by expert treatment. Such arrangements, he said, were already in operation in Germany, France, and North America. He had studied the two systems in vogue in Germany. An example of one of them was the Nürnberg-Fürth-Erlangen Fürsorge, established by Kolb, which had already been copied at Mannheim, Regensburg, and Munich. Under this scheme the Fürsorgestelle was independent of the district lunatic asylum. At Frankfurt, on the other hand, the Fürsorgestelle, founded and directed by Raecke, was an organ of the municipal sanitary office, which (so it seemed) did not allow the experts so free a hand. The patients under care were not only those dismissed or on leave from institutions (with their own consent or that of their relatives), but also patients referred by the magistrates. These were mainly psychopaths. In Nürnberg-Fürth-Erlangen there were more than 1500, in Frankfurt nearly 3000, in Mannheim 420, and in Munich, where the Fürsorge had only been established last year, there were 300 patients under supervision. The Fürsorge did not confine itself to treating the psychic ailments of its patients but also settled their affairs for them, provided legal advice and advocates, procured work, and saw that

they had medicine and small sums of money. In general, said Prof. Fabinyi, the scheme was a success, though it could not be denied that there were occasional accidents and suicides. Describing plans for a system shortly to be established in Budapest, he said that, like Kolb in Germany, he was in favour of slow gradual extension of the organisation. First of all the patients discharged from the huge asylum at Lipotmezö were to be placed under care; next those voluntarily reporting would come under supervision. For the present the centre would be an office at the asylum, which would give free advice; later on this would be moved to the middle of the city; and, last of all, the organisation would undertake the care of cases referred by the magistrates.

Critical Position of Hungarian Doctors.

The regrettable financial straits in which Hungarian medical men find themselves are described in an article recently published by Dr. Valko Rezsö. The proverb "Galen dat opes," he says, does not apply to Hungarian doctors, who have to fight a hard battle to gain even the bare necessities of life. This is not to be wondered at, for the number of practitioners in Budapest has been trebled in recent years. In 1919, before the partition, by which Hungary lost two-thirds of her territory and population, there were 5750 doctors in the whole country and 1814 in Budapest. According to the medical annual there were 2584 physicians in Budapest alone in 1925 and 5466 in the small territory left to Hungary. This unfortunate state of affairs, at a time of great economic difficulty, has made it utterly impossible for all these doctors to earn their living with the honesty on which the Hungarian medical profession has always prided itself. It is no exaggeration, in the words of Dr. Valko, to say that Hungarian physicians have to fight a life-and-death battle for their daily bread. In this struggle medical ethics are sacrificed and the consequence is that doctors do not even stop at criminal abortion. (The Minister of Labour has issued an Order relating to the notification of all abortion cases and enforcing the most stringent control of those midwives whose reputation is not above reproach.) Dr. Valko thinks that the serious financial difficulties of the doctors could best be solved on the following lines: Only the very best scholars should be admitted to the medical faculty of the university. Young doctors sent out from the university, clinics, and hospitals should be given the fullest support by local branches of the Medical Association. All vacant appointments should be registered and the register should be easily available for consultation. The Sickness Insurance should be reformed—this is already being done—so as to permit patients to choose their own doctors freely. Besides making these recommendations, he draws attention to the urgent need for improvement in the financial position of village and country doctors. Provision must be made for getting them suitable dwellings, for in most cases housing difficulties make it impossible for young doctors to settle in the villages. If a decent livelihood could be got in the countryside the capital would be relieved of many surplus doctors and there would no longer be three medical men to every 1000 of the population, as there are at present. Decentralisation is all-important. The problem of the old and invalid members of the profession could be solved, he suggests, by setting up some system of old-age pensions. If all these things were done it is possible that the next decade will bring back the old prosperity which the Hungarian profession enjoyed before the war.

Memorial to Prof. Moravcsik.

A volume has been issued in memory of Prof. Rezsö Moravcsik by his late pupils. It contains a collection of dissertations dealing with the important problems of psychiatry and neurology and reflects the many-sided intellect and inspiring personality of this great teacher. It begins with a short account of his life by one of the most eminent of those whom he taught—Ödön Német. Then follow a series of the professor's own addresses and papers, and, lastly, a collection of 20 articles written by his pupils. The whole is published under his motto: "Officium ante omnia."

Public Health Services.

HEALTH OF THE CITY OF LONDON.

IN his survey report for 1925 Dr. W. J. Howarth discusses the problems peculiar to his district, which has a resident population of 13,000, a working-day population of some 400,000, and casual daily visitors who probably number as many again. The sites continually increase in value; every spare inch of land has to be utilised, and many of the residents are thus crowded into uncomfortable corners. Although the main streets are reasonably wide, many of the connecting lateral streets are very narrow—sometimes little more than alleyways. Scavenging is difficult as most of the premises are lock-up places, and there are only a few hours available for the collection of refuse if the work is to be completed by 9 A.M.; an important advance will have been made when the corporation has succeeded in enforcing the by-law that all refuse must be stored in impervious metal bins provided with lids. The feeding of the large day population is another big problem. A few business concerns cater for their employees on the premises, but the lack of room for extensions prevents this being done generally. The control of the catering tends to fall into the hands of large firms with up-to-date methods and well-organised kitchen establishments. The smaller unsuitable private restaurants are gradually disappearing. A lighter midday meal, "occupying not a quarter of the time of the former midday feast," is the rule, and the whole tendency of city life is to concentrate the work into fewer hours. The food-supply of the worker to-day, says Dr. Howarth, compares favourably with that of 20 years ago, and the chief fault lies with the customers themselves, who do not fully appreciate the essentials of a suitable meal. The increase in the newer type of cheap restaurants has certainly benefited large numbers of people by abolishing the haphazard meal of the penny bun and drink at the fountain.

The increase of business premises and the covering of site areas has made the City quite unsuitable as a general place of residence. Parents bring up children under considerable difficulties, for traffic renders the streets unsuitable for playgrounds until after 7 o'clock in the evening, and little children living on the fourth storey cannot get fresh air. Many buildings regarded as handsome and adequate structures in early Victorian days are now sublet in rooms; dominated by larger and higher buildings, they are now in dark corners. The wood-work of these older buildings is decaying and the fabric is past economical repair. These blots on the City will be materially reduced when the Hutchison-street and Vine-street areas have been dealt with. In the proposed reconstruction schemes accommodation will be provided both outside the City at Shepherdess-walk and inside the City in the Hutchison-street area. The Court of Common Council has approved the provision of 104 tenements at Shepherdess-walk, comprising 342 rooms. This will cost £95,000. The tenements are to include 6 five-roomed flats, 40 four-roomed flats, 36 three-roomed flats, and 22 two-roomed flats, each with its scullery, bathroom, and w.c. The tenements to be provided at Hutchison-street on the site of the demolished buildings will provide for about 250 persons. This provision will, of course, involve a charge on the rates. One of the difficulties in the City is to provide sanitary conveniences, another is to secure proper ventilation for underground kitchens, workshops, and restaurants. Several ingenious plans for dealing with this latter problem are included in Dr. Howarth's report. He is very anxious to secure a clear legal definition of the term "workplace," and is strongly of opinion that an office in which people are employed in clerical work

only should be included under this term. Control is especially necessary where basements are in continuous occupation. Dr. Howarth hopes to see an annual improvement recorded in connexion with the sale, transport, and handling of meat and meat products. The meat regulations of 1924 are being gradually put into force, and prosecutions were successfully undertaken in October for failure by persons carrying meat to use overalls and head coverings. "The registration of places where food is prepared is an urgent requirement, and in addition prepared meat should be amongst the products in respect of which effective regulations preventing contamination are operative." It is anticipated that the slaughter-houses in Aldgate will shortly be closed so far as the slaughtering of cattle is concerned.

The births registered in the City numbered 327, and of these 260 were to non-resident parents. The number of births credited to the City after the addition of 33 children born outside is 100, making a birth-rate of 7·5. There were 705 deaths registered in the City during 1925, 633 being those of "outsiders." There were 84 of City residents in outside districts and the death-rate is 11·7, the same as that for the whole metropolis. There were six deaths of infants under 1 year, making a rate of 60, and phthisis caused a rate of 0·67, as compared with 0·91 for the metropolis.

The need for strengthening and enforcing the enactments against the pollution of the atmosphere by smoke is well illustrated by a table. Another table shows that cremations in the United Kingdom numbered 2700 in 1925, as compared with 2390 in 1924. Full particulars of the meat dealt with in the markets are included in the report. During 1925 courses of lectures on meat inspection were given by the medical officer of health, the veterinary surgeon, and the senior meat inspector. They were well attended by executive officers of local authorities in the home counties. The Sanitary Committee has had under consideration the question of the damage and nuisance caused by the increasing number of pigeons in the City of London, estimated to number about 4000. It might have been expected that the reduction in horse traffic with the lessening of nosebag droppings would have decreased the number of pigeons, but this is probably compensated for by more people providing pigeon food bought from street vendors.

SPECIAL SCHOOLS.

List of Certified Special Schools, Recognised Institutions for the Training of the Blind, and other Defective Students, and Nursery Schools in England and Wales. H.M. Stationery Office. 1*s.*

THIS compilation will be found indispensable to school medical officers and useful to all who are concerned in the education of defective children and adults. The provision made appears ample at first sight, but the impression fades when the accommodation reported as available is compared with the numbers of defectives known to the Ministry of Health and the Board of Education. The list describes provision for about 45,000 defectives, whereas over 170,000 of such children are known to the school medical service, and many are admittedly not yet ascertained. The blind, deaf, and tuberculous child is well catered for, but the needs of the epileptic and the partially blind and deaf—a recently recognised but important class—are still very poorly supplied. Appropriate teaching is available for under 17,000 out of 30,000 known feeble-minded children. The special schools are, moreover, very irregularly distributed; London still has an undue proportion (174 out of 526) and many larger wealthy authorities do little or nothing for their afflicted children. There is grave reason to fear that the provisions of the new Economy Act may be used to perpetuate, if not to aggravate, this unfortunate state of affairs. Local vigilance will be necessary in the next few years to preserve for the physically and mentally handicapped that special training which is for them an essential preparation for the battle of life.

THE PORT OF TYNE.

In his annual report for 1925 to the Tyne Port Sanitary Authority Dr. W. E. Harker states that 74 vessels were visited by him on account of reported or suspected sickness on board; two cases of scarlet fever, one each of small-pox and enteric fever, were removed and necessary disinfection done. No infectious disease was found among the 9110 alien passengers, who were mostly clean. No case of cholera, plague, or yellow fever came under notice, but 4538 rats were caught in 100 vessels; 83 were killed with sulphur dioxide in 15 ships; hydrocyanic acid was not used. The dead rats, more than half of which were black, were burnt in the ships' furnaces. None was plague-infected. Twenty-one ships from ports infected or suspected to be infected with cholera had their drinking-water tanks emptied and purified. The chief diseases reported during the previous voyage or found on arrival were: accidents 200 (10 deaths), venereal disease 78, feverish colds 81, malaria 35, influenza 19 (1 death), consumption 15 (2 deaths), pneumonia 11 (2 deaths), heart disease 10 (5 deaths). The main food imports into the Tyne were wheat, sugar, eggs, and fruit, of which were condemned: 54 tons potatoes, 1206 lb. corned beef, and 4 stone of oranges. The fish landed was good, but 43 of 8658 fishing vessels had to be cleaned and deodorised. In 9485 inspections of ships sanitary defects were found more often in foreign-going (11 per cent.) than in coasting (3 per cent.) ships. Peaks, forecastles, w.c.'s, and bilges of 1168 vessels were found dirty and were cleansed; 1625 old beds were burnt on account of infection. Structural defects as follows were notified and rectified: side ports for refit, 305; defective w.c.'s, 94; deck leaking, 80; defective stoves, 58; water-tanks cleansed, 21. The 18 water-boats of the port were examined and their tanks found in good condition. The Tyne floating hospital is used for isolation and treatment of the more dangerous infectious diseases from abroad, and as a cleansing and disinfecting station; other infectious cases are sent to the city infectious hospital. The usual measures were taken for the relief of venereal disease, but Dr. Harker offers no estimate of their usefulness.

SCHOOL MEDICAL SERVICE.

IN the following table the figures given in the reports from Sheffield, Leamington Spa, and Taunton are summarised.

Name of town.	No. on roll.	Av. elem. school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
Sheffield ..	81,271	72,772	26,221	115,368	15·46
Leamington Spa ..	3,323	2,935	1,095	1,937	9·6
Taunton ..	3,024	2,753	1,010	2,437	20·2

* Excluding uncleanliness and dental defects.

Sheffield.

Dr. Thos. Chetwood explains the unusual brevity of his report by the difficulty experienced in keeping pace with statutory requirements owing to illness in his staff, so that no time was available for other work. Those familiar with his previous reports will regret the loss. Financial restrictions continue to retard the natural growth of the work in Sheffield, although there is some evidence of progress. The extensions to the two open-air schools have been in use this year, and the number of school places has been increased from 204 to 284. A new school for 150 mentally defective elder boys has received approval—another extension of high economic value, for it is this type of school which makes employable and decent citizens out of those who would otherwise be burdens to the community. The junior M.D. schools have accomplished

much; out of 153 past pupils 96, or 63 per cent., are now employed, a proportion which is higher than that for the physically defective school (52 per cent.) or for the deaf (40 per cent.). The amount earned is small, but work with a wage of even 10*s*. a week is better than idleness. The physically defective schools include the King Edward VII. Hospital sanatorium school for surgical tuberculosis, staffed by teachers appointed by the Education Committee which is doing excellent work, and efficient after-care is given by the Cripples Aid Association. Orthopædic agencies in Sheffield fulfil the requirements of the Board, except that there is no orthopædic surgeon under the Education Committee—a serious omission. 289 children who had passed through an open-air school were followed up. Of these 162, or 56 per cent., returned to elementary schools, 70, or 24 per cent., left over age, while 28, or nearly 10 per cent., had to be referred to the tuberculosis officer. It is much to be regretted that the Redmire Camp scheme has been abandoned; a new country home for sick children was, however, opened last year by an organisation belonging to Sheffield teachers. The first case of small-pox during the recent outbreak was discovered at the school clinic.

Leamington Spa.

Dr. W. L. Goldie, in his report on the Royal borough, depicts a locality which is fairly healthy and perhaps a little easy going. The percentage of defects found (9·6) is distinctly low, but the methods of dealing with exceptional children are not very extensive. Good work is done at the school clinic and the facilities for treatment in general appear to be adequate. Dental treatment, noted as necessary in 875 cases, was given in only 357 children. No children are noted as actually in need of treatment for malnutrition and no scheme exists for the provision of meals. There are no special schools in the borough and several feeble-minded and physically defective children are in attendance at elementary schools, apart from 38 who are merely delicate children. Special schools are necessarily less easy to provide in small communities, but a beginning might be made with an open-air school or class. Table 8, which gives a survey of the capacity and sanitary equipment of each of the eight schools, reveals considerable variation and apparent anomalies —for example, most of the schools have one class-room to 30 or 40 pupils, but one infant school seems to have only two class-rooms with 154 on the register. Dr. Goldie notes that none of the schools is provided with a drying room.

Taunton.

Dr. J. Allen, who is also medical officer of health and in charge of the maternity and child welfare departments, gives a clear outline of the school duties which he has carried out unaided except for the part-time services of an ophthalmologist and of a dentist. Two nurses act as attendance officers in addition to their school work; a part-time dental nurse is also employed. During the year Dr. Allen has made a special inquiry into the number of feeble-minded, tuberculous, physically defective, and exceptional children in his area, and each child has been individually examined—no light task with the routine work as well to do. The proportions of blind and deaf children approximate closely to the figures estimated by the Board of Education, but he found 73 feeble-minded children against the Board's estimate of 24; 74 crippled children were noted compared to the Board's figure of 28; 90 delicate children were found where the estimated number would be 43, and 60 cases of active pulmonary or glandular tuberculosis as against 11. The disparity in the figures for mentally and physically defective children is not remarkable, as there is general agreement that the Board's estimates are on the low side, but the number of tuberculous children (confirmed by the tuberculosis officer) is disturbingly high. An orthopædic scheme is now in force jointly with the Somerset County Council, but the proposal for a new special school to be run on open-air lines has unfortunately been postponed.

Correspondence.

"Audi alteram partem."

X RAY TREATMENT OF CANCER.

To the Editor of THE LANCET.

SIR,—The critical position of the X ray treatment of cancer at the present time is attributable to two main causes. First, the impossibility of arriving at accurate physical dosage, even with the newest and most complicated apparatus of the ionisation type, some of which, even in their commercial form, require the services of a whole-time physicist. The error of such measurements may reach 20 per cent., and the conception upon which current dosage tables are founded has been proved wrong by subsequent work. In particular Borrel, Altman, Glocker, Rothacker, and Schönleber have shown that these tables make too great an allowance for increase in depth dose by scattered radiation. Ionisation measurements have no advantage over the older pastille and photographic methods in the hands of an expert.

Secondly, the theories upon which X ray treatment has been based are now no longer tenable. The law of Arndt Schulz, which states that small doses excite, moderate doses inhibit, and large doses destroy, must be discarded in its entirety. It is this law which allowed the conception of an "irritation" dose to penetrate into Rontgen-therapy. Holzknecht has shown from clinical experience that the "irritation" dose does not exist independently, but is only an early stage of the destructive process which follows every Rontgen irradiation. When small doses are given the "irritation" stage can be observed for a longer time, when large doses are given the "irritation" phase is obscured by the destructive. Nather and Schinz, from large experimental material, have demonstrated the fallacy of the "irritation" dose.

The belief that every carcinoma can be destroyed by a dose of 90–110 per cent. of the skin dose (H.E.D) is no longer current. Failure was at first explained on the theory that some part of the growth must have received an "irritation" dose; then, when the refractory nature of certain tumours was obvious, the dose was considerably increased, with serious internal injuries as a sequel. We know now that the "irritation" dose does not exist. Further, instances of the successful cure of carcinomata by doses much in excess of the "carcinoma" dose prove that the specific "carcinoma" dose does not exist. Fischer says that carcinoma is a generic term for a class of tumours insufficiently classified, containing widely different types. These types differ in radio-sensitivity. Some will disappear after receiving 50–70 per cent. (H.E.D), others require 400–500 per cent. Martin, for epithelioma, gives 150–500 per cent., and Kummer gives 300–500 per cent. spread over ten days.

I have had the opportunity of observing the excellent results of treatment of epithelioma obtained by Rapp at the Samariterhaus, Heidelberg, using the "step-up" filter method. Introduced by Ghilarducci, the technique is essentially as follows:—

> The affected area is treated through a localiser, receiving on the first day 100 per cent. unfiltered, on the second day 100 per cent. filtered through 1 mm. aluminium, on the third day 100 per cent. through 2 mm. aluminium, on the fourth day 100 per cent. through 3 mm. aluminium, on the fifth day 100 per cent. through 0·5 mm. zinc. Allowing for modification to suit any given case the patient may receive a dose up to 500 per cent.

The results in epithelioma and lupus carcinoma are striking. Lupus carcinoma, incidentally, is common in Germany, a fact ascribed by Rapp to previous treatment of the lupus by X rays.

Granted then that the carcinoma dose does not exist and that different carcinomata possess a different degree of radio-sensitivity, the question now arises: Can the histological nature of a tumour serve as an index of its radio-sensitivity? Ulman thinks that

squamous epitheliomata relapse after small or large doses of X rays, but that basal-cell carcinomata hardly ever relapse or give rise to metastases, however the dose may be varied. This view is opposed by S. and I. Forestier, who maintain that histological character does not influence radio-sensitivity to gamma radiation, basing their opinion on some cases of cancer of the cervix uteri.

In former times the radio-sensitivity of cells was believed to be a function of the degree of activity of cell metabolism and of the stage of differentiation—propositions inherent in the law of Bergonié and Tribandeau. We owe to Mohr, Holthusen, Lacassagne, Monod and Regaud the explanation that the effect of radiation upon a cell depends on a definite cytological stage; that in the testicle, for example, the vulnerability of the cell is at a maximum during cell division at the stage of equatorial arrangements of the chromatin meshes. This observation has been found to apply to normal cells and cancer cells alike, and Pordes has endeavoured to explain this upon theoretical grounds.

What practical inferences can we draw from these new points of view? First, that the law of Bergonié and Tribandeau is insolvent. Secondly, that the Wintz method is useless. This method, as is well known, consists in giving a total "carcinoma" dose during one séance, sometimes lasting 6–8 hours, with the idea of destroying all cancer cells at a stroke and giving them no chance of recovery. But fractional doses are now freely given without the least fear of provoking irritation, with the intention of influencing, at each irradiation, the cells which happen at that moment to be in the mitotic stage. Since the exact time of this stage is unknown, the irradiation times must be arbitrarily chosen. Forestier, in the hope of bringing some precision into this serious question, suggested his "index of karyokinetic activity," which represents the ratio of the number of cells in the division stage to those in the resting stage. The index so calculated determines the duration of application. Seth-Hirsch (New York) instead of using fractional doses keeps the tumour under continual weak action of X rays for eight days, calculating to reach the limit of tolerance only at the end of a week.

The old principles and views on which Rontgen-therapeutics were formerly based are thus to be found inadmissible and are being replaced by new theories, not yet assured of general acceptance, nor sufficiently well established for translation into terms of practice. The results of practice remain much the same; a complete cure cannot be promised, and radical surgical operation, whenever possible, remains the method of choice. To radiology there remains the field of prophylactic irradiation and of inoperable cases.

I have now outlined the causes which account for the deep pessimism which is general among Rontgen-therapists. Levy-Dorn jestingly states that radio-therapy can claim two successes—epilation and castration. Rapp thinks the method will probably be abandoned in favour of chemotherapeutics. What is the final destiny of radiotherapy it is impossible to foretell. The Russian poet, Poushkin, says: "A heavy hammer, breaking glass, forges a sword." Let us hope that the present period of transition will succeed in forging a sword which will deal the death-blow to one of humanity's most cruel foes—cancer.

I am, Sir, yours faithfully,

N. A. PODKAMINSKY, M.D.,
Administrator of the Rontgen Department of the All-Ukrainian Institute, Kharkow.

To the Editor of THE LANCET.

SIR,—Duties in connexion with the national crisis prevented an earlier reply to the letter of Sir John Thomson-Walker in THE LANCET of May 1st. It is, of course, not to be expected that two parties looking at a problem from widely different angles should have similar views. Ever since I have been in a position to form any judgment it has been my view that in the treatment of any *disease* surgery must always be looked upon in the light of an expedient, pending the discovery of something better. It is not to the point that good results can be attained in certain cases of early malignant disease by operation. If the same result can be got by other means without removal of tissue, such means should be employed before any operation is attempted. The vast majority of patients dread operation, and if they can be cured without it they will avoid a disturbance of physiological balance which is an important factor in many cases. Radiology too is cheaper than surgery.

When Sir J. Thomson-Walker speaks of the hard rays in cancer having been for some time under careful trial in this country I should like to know where, when, and under what conditions the test was made. Whether surgery is at a "dead end," as I stated, is a matter of opinion, and I think I gave adequate reasons for mine. Regarding the "many serious risks" of hard rays to which he alludes, the fact is that his opinions are based on a different class of experience from my own. That there have been disasters following on intensive X ray applications I know probably as well as anyone—these are bound to happen while we are gaining experience in the use of any agent of equal power—and I have made it my business to investigate as far as possible every case that came to my notice. In some carelessness or incompetence or both were at work. Errors of judgment involving faulty technique, or the treatment of unsuitable cases, accounted for others, but I could find nothing reflecting on the system. If the technique is carefully carried out in early cases where the lesion is circumscribed and the general health not seriously impaired, then I am confident that radiology is without the risks of operation and will achieve as good or better results in a pleasanter way.

Sir J. Thomson-Walker takes exception to my having claimed "a high degree of success in the relatively few early cases of malignant disease that have been referred to me before there had been any surgical interference," and quotes the results in a few cases he was kind enough to send me. I was not thinking of these cases when I made that statement, and for the reason that I did not consider any one of them likely to be cured by any method at present known to us. If the prospect was so favourable why did not Sir J. Thomson-Walker deal with these cases himself? I can trace 15 cases sent to me by him directly or on his advice between August 14th, 1921, and Jan. 22nd, 1923. The ages vary from 55 to 81 with an average of over 62—a severe test for a method that depends for success on a reasonably normal vitality and recuperative power. Ten cases were malignant prostate, some with extensions to bladder, rectum, or glands. A few were complicated with an infection—a very fatal combination in my experience. It will be five years in August since the first, and three years last January since the last of these cases came into my hands. Does Sir J. Thomson-Walker wish to infer that a larger number of these cases would have been alive now if (*a*) they had been left alone, or (*b*) he had dealt with them himself by the usual surgical methods?

The fact is that the cases quoted differ in no degree from the usual type passed on to radiologists by surgeons with the further disadvantage of the age being unduly high. It would be difficult to find a more unsuitable series of cases on which to test the value of any method of treatment, and it is not open to anyone to say that the claims on behalf of the Erlangen system are extravagant until a proper test, under the conditions existing at its place of origin, has been made and found wanting. No such test has yet been made in this country. I am, Sir, yours faithfully,

London, May 21st, 1926. REGINALD MORTON.

EMETINE IN THE TREATMENT OF HEPATIC ABSCESS.

To the Editor of THE LANCET.

SIR,—May I answer, very shortly, Colonel Thurston's letter in your issue of April 10th, which I have, unfortunately, only just seen. 1. My patient had

declined operative interference. 2. He recovered. 3. Colonel Thurston relies on aspiration and emetine—in that order—but, in my opinion, he over-estimates the effect of aspiration and under-values that of emetine.

I am, Sir, yours faithfully,

May 19th, 1926. V. S. HODSON.

BACTERIAL INFECTION AND ACCIDENTAL HÆMORRHAGE.

To the Editor of THE LANCET.

SIR,—I wonder whether the "close relationship" found by Prof. F. J. Browne to exist between accidental hæmorrhage and toxic states [1] is really due to the "associated increased head of urea in the blood," or to the concomitant rise of general blood pressure. Accidental hæmorrhage, in its worst forms, seems to differ little from cerebral hæmorrhage in its worst form. On the post-mortem table the pregnant uterus, the seat of (concealed) accidental hæmorrhage, apparently differs but little from the brain in cases of extensive cerebral hæmorrhage (which is nearly always concealed). If a pregnant woman with slightly damaged kidneys eats unwisely at night, and in consequence twists and turns in bed, unable to sleep, the placental sinuses may give way, just as in the non-pregnant, with damaged cerebral arteries, a rupture under similar circumstances may occur. In the former case the placental sinuses give way unless they are sufficiently "supported"; their conservation depends on the intra-amniotic pressure. If this is maintained high, as in primigravidæ, accidental hæmorrhage is less likely; if it is on the average low, as in pregnant multiparæ, accidental hæmorrhage is more likely. 80 per cent. of the cases of eclampsia occur in primigravidæ; 80 per cent. of the cases of accidental hæmorrhage in pregnant multiparæ. It is a curious and interesting distribution.

Eclampsia and accidental hæmorrhage, it is stated, are both forms of the "toxæmia of pregnancy." THE LANCET, not so very long ago,[2] stated that in the former type there is no accumulation of nitrogenous waste products in the blood; to-day we read that in the latter type there is "an increased head of urea in the blood." But obstetric authorities (in the recent past) have suggested that the different forms of the various toxæmias of pregnancy depend in the presence or not, and in sufficient quantities, of respective antibodies. Eclampsia occurs because one type of antibody is not produced in sufficient quantity and accidental hæmorrhage because a different type of antibody is insufficient. These authorities must have missed the highly significant increase of the urea, &c., in the blood in the latter cases reported to-day in THE LANCET.

It is, however, curious that if a woman be the subject of chronic nephritis and become pregnant, that the pregnancy should advance near or quite to term; and that even the babe in some—indeed, in many—cases of accidental hæmorrhage, should be so well developed as appears. Prof. Whitridge Williams, in London, in April, 1925, reported a case of this type. From the photograph shown on the screen (of the uterus and babe in situ), the child appeared a normal full-time infant, well developed. The patient developed anuria from which she died. And in an annotation last week[3] you refer to the effect on the body (in the non-pregnant state) of diminishing the amount of kidney substance beyond a certain extent. If between 62 to 68 per cent. of the kidneys be removed, "the animal survives for a considerable time" ... "the deciding factor between death and survival being whether the remaining portion of the kidney hypertrophies" or not. If the kidney is so essential to the individual, how in pregnancy can a well-developed babe be produced if the mother be the seat of chronic nephritis? How, then, can chronic nephritis be the cause of accidental hæmorrhage?

I submit we have got to look elsewhere. A "black" (pregnant) uterus may look like a "black" brain, but it also simulates a "black" eye, and may even have the same sort of pathology.

I am, Sir, yours faithfully,

R. H. PARAMORE, F.R.C.S. Eng.

Rugby, May 22nd, 1926.

[1] THE LANCET, May 22nd, p. 988.
[2] Some Toxæmias of Pregnancy, THE LANCET, 1921, ii., 614.
[3] High Protein Diets and Renal Insufficiency, THE LANCET, May 22nd, p. 986.

THE COUNCIL OF INDUSTRIAL MEDICINE.

To the Editor of THE LANCET.

SIR,—Of recent years there has been a steady increase in the number of large industrial concerns in this country employing medical men and women to advise their management regarding factory hygiene, the prevention of avoidable accidents, illness, and industrial diseases, and to assist in promoting the general well-being of the staff and workpeople. This increase, and the example set in America for some years past, led to the formation last year of "The Council of Industrial Medicine" as an association of British industrial physicians and surgeons. This Council already has over 40 members and meets regularly on the fourth Friday in each month at 12, Stratford-place, London, when discussions take place on the various problems confronting this comparatively new branch of preventive medicine. The Council is also the British section of the International Congress on Industrial Accidents and Diseases which held its fourth meeting in Amsterdam last autumn. It is hoped that the International Congress of Industrial Accidents and Diseases will at some future date hold a meeting in London. The actual date will be fixed by the International Committee.

The Council of Industrial Medicine is anxious to coöperate with all British medical practitioners (at home and abroad) who are specially engaged in industrial medicine. The executive are well aware that there are still a number of medical practitioners in Great Britain giving general or special medical services to industrial concerns with whom so far it has not succeeded in getting in touch, and will be grateful if any such will write to the Secretary, Council of Industrial Medicine, Federation of Medical and Allied Services, 12, Stratford-place, London, W. 1.

I am, Sir, yours faithfully,

D. A. COLES,

May 25th, 1926. Chairman.

IS LEUKÆMIA CANCEROUS?

To the Editor of THE LANCET.

SIR,—May I call your attention to certain facts which are a source of difficulty to humble followers of modern cancer research work. First, Ellerman and others have published many papers concerned with the transmission of leukæmia in the fowl. It can be transmitted by a cell-free filtrate. There seems to be no doubt now that it is typical leukæmia although it was formerly argued by some that it might be an obscure form of tuberculosis. Secondly, Rous, Gye and Barnard, and others have worked with another transmissible tumour which is a spindle-celled sarcoma and which has apparently no affinity with leukæmia. Thirdly, quite a number of others have worked with frankly non-transmissible tumours which everyone would admit to be cancerous.

In all three cases the work is sufficiently easy to follow because enough information is given about the original growth to permit of some idea of its nature. But there is another class of case in which doubts do arise. This class has long been known under a great variety of names—chloroma, lymphosarcoma, sarcomatosis, &c. Cases present apparent tumour formation in association with the generalised tissue and blood changes of leukæmia. I have not detailed references by me, but I have no doubt that many people would call such cases cancer and would base cancer statistics on them. Hastings Gilford seems to envisage the added tumour formation as being of the nature of a malignant change in the previously non-malignant leukæmia.

Now, although leukæmia may in one direction come very close to cancers, in the other it merges into a series of clinical pictures which seem to have little or nothing to do with cancer. And in all cases, including the lymphosarcoma or sarcomatosis type, it is sharply divided from cancer *by being at its inception a generalised disease*. Cancer is at its inception strictly localised. There is a further hint of some fundamental difference in nature in the fact that a sarcoma of bone, for instance, will expand and thin out the bone over it which a leukæmia marrow will never do, and in the fact that sarcoma impairs the function of an organ to the extent of its involvement of that organ, whereas a whole organ—e.g., a kidney—may be pervaded with leukæmic growth and yet suffer no perceptible impairment of function.

Other differences might be cited, and even if experts may not consider them conclusive there is no question but that they raise doubts which ought to be settled. If any part of modern cancer research is being based on what is in fact leukæmia, conclusions arrived at are ipso facto suspect until the above-mentioned disparities are explained and harmonised. No one seems to have thought it worth while to attempt such explanation and précis writers often fail to mention what sort of growth is being dealt with. It follows that readers are involved in difficulties and are inclined to doubt the propriety of endowing cancer research without any definite decision as to what constitutes cancer.

I am, Sir, yours faithfully,

Sevenoaks, Kent, May 16th, 1926. GORDON WARD.

Obituary.

JOHN HEDLEY CROCKER, M.D., D.S.Sc.VICT.

ON May 17th Dr. J. H. Crocker died suddenly at Brighton, where he had been living for some years in retirement. He was 67 years of age. Born of a West Country family he was brought up in Tavistock and came to London to study medicine at Charing Cross Hospital, where he distinguished himself as a student and held house appointments. After voyages to China and Japan as ship's surgeon, he went to Eccles to take charge of a Friendly Societies' Medical Association, but soon afterwards took up private practice in the town and made a name for himself as a very able practitioner who took a great deal of trouble over his cases. Dr. Crocker had qualified as M.R.C.S. Eng. in 1884. In 1892 he graduated with first-class honours in the Victoria University and two years later, whilst in private practice, took the M.D. at Victoria University and also the diploma in Sanitary Science. This was followed by his appointment to the public health service. In general practice, his tact and charm of manner and his remarkable gift for winning the confidence of his patients had been immense assets, and also his aptitude for conveying to patients in non-technical language an accurate idea of their condition. These qualities of mind and character stood him in equally good stead when, partly for health reasons, he turned to administrative work. He became successively medical officer of health for Eccles, and for the new Manchester Port after the opening of the Ship Canal, and finally went to Richmond, Surrey, where, in spite of a serious operation and poor health, he carried on his work with keen interest. Even when he retired to Brighton he did not lose touch with everyday affairs, and he seemed to have several years of useful and well-earned retirement before him; as a member of the East Sussex County Council his advice and knowledge of public health were in constant demand. In each of the communities which he served during his life Dr. Crocker won a high reputation, and many colleagues will remember him as a good friend, always ready to do a good turn to others, and with a capacity for enlivening the occasion. He leaves a widow and one child.

HENRY BROUGHAM GUPPY, M.B., C.M. EDIN., F.R.S.

THE death of Dr. H. B. Guppy at Martinique on April 23rd, at the age of 72, brings to an end a long career of scientific observation and investigation. The son of the late Dr. T. S. Guppy, of Falmouth, he was educated at King's School, Sherborne, and at Queen's College, Birmingham, proceeding to St. Bartholomew's Hospital, and the University of Edinburgh for his medical training. Graduating in 1876, he entered the Naval Medical Service, and was sent out to the Far East; it was as surgeon of a surveying schooner in the Western Pacific that he laid the foundations of his scientific work. Whilst engaged in oceanography he made use of his opportunities to study the formation of coral reefs in the Solomon Islands, and on leaving the Navy in 1885 devoted his attention to this branch of natural history. In 1887 he investigated coral reef formation in the Keeling Islands and Western Java, and his interest was attracted at this time towards the problems of plant dispersal, which mainly occupied his later years. On this and similar subjects he made many shrewd notes and deductions, and in recognition of his work on the geographical distribution of animals and plants, he received the gold medal of the Linnean Society in 1917 and was elected F.R.S. in the following year. Dr. Guppy was a man of an intensely inquiring turn of mind, and a good illustration of his ability to do valuable work wherever he happened to be is found in a contribution[1] to the *Proceedings* of the Royal Physical Society of Edinburgh, in which he describes a mass of observations on changes of temperature in the small and large rivers and ponds in the immediate neighbourhood of Kingston-on-Thames, and indicates their importance to the flowering and propagation of plants. As an author he will be chiefly remembered for three books: "Observations of a Naturalist in the Pacific" (1906), "Studies in Seeds and Fruits" (1912), and "Plants, Seeds, and Animals in the West Indies and Azores" (1917). Each of these contains a wealth of information invaluable to the student of plant geography, and it is in the last of them that Dr. Guppy develops his differentiation theory, according to which the restricted biologic groups represent derivatives of cosmopolitan types differentiated in correspondence with the integration of environment, and especially climatic environment. Several other books also reflect his wide interests and thoughtful mind.

Dr. Guppy was twice married, but leaves no children. He lived at Fowey in Cornwall.

THE LATE MR. HUGH BRAUND KENT.

Mr. H. B. Kent, who died at Tongshan on Nov. 24th last, was a man of considerable ability, and, although only 43 years of age, had distinguished himself in North China as a surgeon. We are indebted to Dr. John Fawcett for the following particulars of his career and work.

Hugh Braund Kent was the fourth son of Mr. Horace Kent, barrister-at-law, of Cholsey Mill, near Wallingford, Berkshire, and was educated at Oxford High School. Entering Guy's Hospital in 1904, he became popular amongst his contemporaries and proved his merit as a student. In 1908 he graduated in medicine in the University of London and was appointed clinical assistant at Guy's in the following year. Circumstances, however, compelled him to enter some kind of practice and to forego the house appointments which would have followed. In 1909 he left hospital and accepted a post in the Colonial Service in West Africa; in the following year he went to Tongshan as principal medical officer of the Kailan Mining Administration and the Chinese Peking-Mukden Railway.

When Kent took over this work in July, 1910, there was a hospital for foreign residents and for the

[1] Vol. xii., 1894.

Chinese at Tongshan, but it was by no means fully equipped for the practice of modern medicine and surgery. By the time of his death last year the hospital had undergone a great change; it had been greatly extended and thoroughly fitted out for work of almost every kind. To effect such an improvement the coöperation and support of his employers were, of course, essential, but it was Kent's initiative, perseverance, and recognised ability which ensured that they were freely given. In his relations with the Chinese he was remarkably successful, and he so won their confidence as even to overcome their prejudices against surgical operation. The money required for the hospital's X ray apparatus was subscribed mostly in small sums by the Chinese themselves.

Fifteen years is a short time in which to establish a reputation as a first-class surgeon, and yet Kent did it in spite of grave disability at times from ill-health. For the last 13 years of his life he suffered recurrences of illness bad enough to render many men permanent invalids; but his ill-health seemed only to brace him to renewed activity. In 1919 he obtained leave to come home and work for the degree of M.S. Lond. and again in 1923 for the diploma of F.R.C.S. Eng. In both of these examinations he was successful.

"The value of a man's life," writes Dr. Fawcett in an appreciative note, "is measured not in length of days, but in what he accomplishes in the short space allotted to him, and in that sense Kent kept the measure filled to the brim. Nevertheless, his friends here and in China cannot cease to deplore the fact that he died so young and withal so full of promise for the future; happily he ripened early and lived long enough to reap some of his sowing, although the full harvest was never garnered. . . . He had the true surgical instinct, the keen eye and sure hand, and the confidence based on knowledge; he possessed the mind and will to overcome difficulties, the inability to recognise defeat. In fact, he was the very type of Englishman eminently fitted for the pioneer work he undertook in a foreign country—work which redounded not only to his own credit, and incidentally to that of his parent medical school of which he was so fond, but at the same time was of incalculable benefit to his fellow creatures in that great and far continent of China to which he devoted the best years of his short life."

JAMES MACDONALD, M.D. EDIN.

Dr. J. Macdonald, who died on May 10th at Carlisle in his 70th year, had a large practice in the city. He was born in Edinburgh and educated at the Edinburgh Royal High School and at the University, where he took his M.A. degree before he was 18 years of age. In 1881 he graduated in medicine and worked as assistant to doctors in Newcastle and Manchester before going to Carlisle in 1884. Some two years afterwards he entered practice on his own account, and his services were in such demand that his work soon became very heavy. In 1895, however, he found time to write a thesis on diphtheria which gained him the M.D. degree and was commended. For about 40 years, moreover, he was medical officer to the Carlisle Fever Hospital and he held a number of other public appointments in the neighbourhood, including that of medical officer to the Carlisle Rural District Council. Before the Insurance Acts came into force he also served the Sick Society carried on by the workers at Messrs. Carr's factory, and since 1917 he had been chairman of the Cumberland Panel Committee. He was also deeply interested in the work of the British Medical Association. Many kinds of sport found in him an active supporter, and one who had knowledge as well as enthusiasm; he played Rugby football for his school and university. Dr. Macdonald was twice married and leaves a widow and two sons, one of whom is likely to carry on his father's practice. Another son was killed during the war.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. R. F. Clark is placed on the Retd. List with the rank of Surg. Rear Adml.

Surg. Lt.-Comdr. H. B. Padwick to be Surg. Comdr.

Surg. Comdr. A. R. Davidson is placed on Retd. List with rank of Surg. Capt.

J. M. Sloane to be Surg. Lt.

Lt. W. H. Mobley is placed on Retd. List.

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg.-Lt. R. W. H. Tincker to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. J. W. C. Stubbs is restd. to the estabt.

Capts. R. A. Flood, C. C. Jones, J. Rowe, and H. C. D. Rankin to be Majs.

The undermentioned are restd. to the estabt.: Maj. R. G. Meredith, half-pay list, late R.A.M.C.; Capt. C. Armstrong, half-pay list, late R.A.M.C.

Temp. Lt. A. L. Moorby relinquishes his commn.

ROYAL ARMY RESERVE OF OFFICERS.

Lt.-Col. R. A. Cunningham, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

MILITIA.

Capts. H. C. G. Pedler, E. S. Rowbotham, and J. Melvin to be Majs.

TERRITORIAL ARMY.

Capts. A. M. Johnson and C. A. Webster to be Majs.

Capt. H. L. Barker (I.M.S., retd.) to be Capt.

M. L. Sutcliffe to be Lt.

The King has conferred the Territorial Decoration upon the undermentioned officers: Lt.-Cols. A. W. Moore and P. H. Mitchiner; Majs. W. F. Denning, H. E. S. Richards, and A. L. S. Tuke; and Capts. (Maj. Prov.) H. Pinto-Leite and A. C. M. Savege.

ROYAL AIR FORCE.

The undermentioned are granted short service commissions as Flying Officers for three years on the Active List: R. J. I. Bell, R. G. Freeman, and D. Oliver (who is seconded for employment at the Hull Royal Infirmary).

Flight Lt. M. Coghlan relinquishes his temporary commission on ceasing to be employed.

Flight Lt. D. McLaren is promoted to the rank of Squadron Leader.

INDIAN MEDICAL SERVICE.

Majs. J. Taylor, A. D. Stewart, R. A. Chambers, R. H. Bott, J. Morison, S. G. S. Haughton, A. S. Leslie, J. F. James, A. P. G. Lorimer, H. B. Scott, G. McG. Millar, H. H. Thorburn, F. H. Salisbury, and C. R. O'Brien to be Lt.-Cols.

The King has approved the retention of the temp. rank of Capt., on perm. appt. to the I.M.S., as Lt. by E. T. N. Taylor.

The King has approved the retirement of Lt.-Col. G. E. Stewart.

Col. A. N. Fleming, A.D.M.S., Sind-Rajpatana District, has been appointed Honorary Surgeon to the King, in succession to Col. P. Dee, retd.

Maj. J. S. S. Martin, Indian Station Hospital, Multan, officiates as Deputy Assistant Director of Medical Services at Army Headquarters, vice Maj. G. R. Lynn, on leave. Maj. A. F. C. Martyn to be Specialist in Dermatology, Rawalpindi district, vice Maj. W. B. Rennie, vacated. Capt. C. G. G. Keane to be Specialist in Otology, Eastern Command, vice Capt. C. H. C. Byrne. Capt. G. A. Hildreth to be officer in charge, Brigade Laboratory, Bynnu, vice Lieut. K. M. Bharucha.

DEATHS IN THE SERVICES.

Lieut.-Colonel Lewis Allen Irving, O.B.E., A.M.S., retd., who died on May 15th, aged 76, at 22, Westgate-terrace, S.W., was the youngest son of the late Major-General Alexander Irving, R.A. Educated at Dublin and in Germany he entered the Service as assistant surgeon in 1871, becoming lieut.-colonel after 20 years' service, and retiring in 1898. He saw service in South Africa and India, and was commandant of the Military Lunatic Hospital, Netley. Later he became a medical officer for recruiting in the London district, and on the outbreak of war was engaged in the relief of Belgian refugees. For his services he received the O.B.E. in 1918, and the Belgian Order of Leopold. After the war he interested himself in the Chelsea branch of the Incorporated Soldiers' and Sailors' Help Society and the Emergency Help Fund of the British Red Cross Society.

Colonel Irving was twice married, and leaves three daughters. His second wife, who was Ethel Southey, was a great-niece of the former Poet Laureate.

Surg.-General James O'Brien Williams, R.N., retd., died at his home in Ottery St. Mary, Devon, recently in his seventy-fifth year. Educated at Wellington and at University College, Dublin, he became a Licentiate of the Royal College of Surgeons in Ireland in 1875 and graduated two years later M.D., M.Ch. R.U.I. During Osman Digna's operations against Suakin in 1887–88 he was surgeon of the *Albacore* and received the thanks of the Egyptian Government for his valuable services, placed voluntarily at the disposal of the senior medical officer of the Egyptian Army, and for his action in assisting to dress the wounded after the action of March 4th, 1888. He retired with the rank of Surgeon-General in 1911. The deceased officer leaves a widow and two sons.

Medical News.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College on May 19th Dr. A. Logan Turner, President, in the chair, the 20 successful candidates out of 58 entered, who passed the requisite examinations between Jan. 4th and 11th were admitted Fellows:—

John C. Ainsworth-Davis, Solomon Bloom, Harold D. Cameron, John W. Costello, John L. Davies, Appu Hennedige Theodore de Silva, Ernest R. Frizelle, Dewell Gann (examination passed July, 1925), Edwin S. Gawne, Wilfrid L. Graham, Milne C. Harvey, Ranfurly P. S. Kelman, Hugh D. Logan, Malcolm Robertson, Norman C. Speight, Brian H. Swift, Donald Tregonning, Stanley V. Unsworth, Victor G. Walker, and James M. Webster.

The following candidates having passed the requisite examinations received the Higher Dental Diploma:—

Robert H. Reay and John Wells.

UNIVERSITY OF LONDON.—A meeting of the Senate was held on May 19th when it was announced that the University Chair of Physiology tenable at the London School of Medicine for Women, now held by Miss Winifred Cullis, D.Sc., will henceforth be known as the Sophia Jex-Blake Chair of Physiology in the University of London.—Dr. F. J. Browne, who (as announced in THE LANCET last week) was appointed as from July 1st next to the University Chair of Obstetric Medicine tenable at University College Hospital Medical School, was from 1906 to 1919 a general practitioner in a mining district in Wales. In 1919 he was appointed senior resident medical officer at the Royal Maternity and Simpson Memorial Hospital, Edinburgh, three months later becoming research pathologist, and in 1923 assistant physician at the hospital; he was also assistant in and later in charge of the antenatal department. Since 1921 he has held the post of clinical tutor and senior clinical assistant in gynæcology in the Royal Infirmary, Edinburgh.—Sir Holburt J. Waring was appointed representative of the University at the celebration of the bicentenary of the foundation of the faculty of medicine in the University of Edinburgh to be held in June, and Dr. R. A. Young was appointed representative at the twelfth Annual Conference of the International Association for the Prevention of Tuberculosis to be held in Glasgow in July.—The Dunn Exhibitions in anatomy and physiology were awarded to Mr. A. M. Easton, of St. Thomas's Hospital Medical School, and Mr. D. F. Ogborn, of University College, respectively. (Mr. Ogborn has since lost his life in a boating accident.)—On the recommendation of the school committee of University College Hospital Medical School, Mr. G. Payling Wright was appointed to the Graham Scholarship in pathology for two years from Oct. 1st, 1926.—A letter was received from the Treasury Solicitor announcing that the London University Site in Bloomsbury had been offered back to the Duke of Bedford under the terms of the clause in the Conveyance to the Commissioners of Works and that he had accepted the offer to re-purchase.—The Senate has appointed Mr. Thomas Franklin Sibly, D.Sc., the present Vice-Chancellor of the University of Wales, to the post of principal officer of the University in succession to Sir Cooper Perry, who retires on August 31st next.

Postponement of Examinations.—In view of the termination of the strike the Senate has reviewed the arrangements made for postponing examinations usually held in June and July. The first and second examinations for medical degrees and examinations in dentistry are postponed for one week from the dates mentioned in the regulations. No change will be made in the dates of examinations for the M.D. and M.S.

LONDON HOSPITAL MEDICAL COLLEGE.—Mr. Neville Chamberlain, the Minister of Health, will distribute prizes at the College on the afternoon of Monday, June 28th.

THE death is reported from Hull of Dr. James Patrick McGorry, from encephalitis lethargica, on May 24th. Dr. McGorry, who was 24 years of age, graduated M.B., B.Ch. in the National University of Ireland in November, 1924.

CHADWICK LECTURE.—Sir William Collins will preside at an open-air lecture on the Plant as a Sanitary Engineer, to be given by Prof. J. McLean Thompson on Thursday, June 3rd, at 5 P.M., in the Chelsea Physic Garden, Swan Walk, Chelsea Embankment, London. (Gardens open from 4.15 P.M. Lecture in hall if wet.)

NATIONAL INSTITUTE FOR THE DEAF.—The second annual meeting of the Council will be held at the Mansion House, London, on Friday, June 11th, at 3.30 P.M., when Lord Charnwood will preside. The presence of medical men will be especially welcomed. It is at present impossible to announce the names of the speakers.

DINNER TO SIR STCLAIR THOMSON.—A complimentary dinner to Sir StClair Thomson, President of the Royal Society of Medicine, is to be given by the Section of Laryngology at the Edward VII. Rooms, Hotel Victoria, Northumberland-avenue, on Friday, June 4th. Any Fellows and members of other sections of the Society are asked cordially to support members of the Section of Laryngology by applying for tickets for themselves and their guests. Ladies may be invited. Tickets should be obtained from Mr. Norman Patterson, 82, Portland-place, London, W. 1.

THE LATE DR. M. V. MCKECHNIE.—Montague Vaughan McKechnie, who died recently at the age of 56, had practised in Eastbourne for rather more than 20 years. He was the founder of the Eastbourne Ear, Nose and Throat Hospital, and of the Eastbourne Royal Eye Hospital, and was keenly interested in other similar institutions in the town. He was a keen sportsman and dog fancier, and his interest in politics and sport brought him into contact with many different sections of the community with the result that he was very widely respected. Dr. McKechnie received his medical training at the London Hospital and at the Universities of Durham and Edinburgh.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Monday, May 31st, at 2.30 P.M., Mr. Saner will give a special clinical demonstration in surgery at the Royal Northern Hospital. On Thursday, June 3rd, at 12.45 P.M., Mr. Hepburn will open a series of demonstrations in ophthalmology at the Royal London Ophthalmic Hospital (Moorfields). These demonstrations will be open to all members of the medical profession without fee. From May 31st to June 12th there will be lectures and demonstrations in diseases of children at different hospitals and clinics. Application should be made to the Fellowship for a programme. The Chelsea Hospital for Women has organised a two weeks' course in gynæcology from June 9th to June 22nd. (It should be noted that this course begins on Wednesday, instead of the customary Monday.) From June 7th to July 3rd the All Saints' Hospital will provide a four weeks' course of instruction in genito-urinary diseases. From June 14th to 26th the City of London Hospital for Diseases of the Heart and Lungs will give a special course in diseases of the chest. The entire practice of the hospital will be open to those enrolling. From June 14th to 25th there will be a special course for general practitioners at the London Temperance Hospital. The hour fixed is 4.30 to 6 P.M. Copies of all syllabuses, of the General Course programme, and of the *Post-Graduate Medical Journal* may be had on application to the Secretary of the Fellowship, at 1, Wimpole-street, London, W. 1.

THE LATE DR. D. FRASER.—At the age of 85 Dr. Donald Fraser died on May 19th at Elderslie. He was born in Glasgow and graduated as M.B. at the University there in 1867. His training was done in the old Glasgow College, and amongst his fellow students was the late Prof. Joseph Coats, whose sister he afterwards married. In 1870 he took his M.D. degree and began a long connexion with Paisley by settling down in practice there. An immense amount of work came his way, and he is remembered as one of the local pioneers in the campaign against tuberculosis; for a long time he was consulting physician to several sanatoriums. For 43 years he was responsible for the administration of the Paisley District Asylum at Riccartsbar, and a book on epilepsy published in 1924 and reviewed in our columns (1924, ii., 753) contains valuable records from a long clinical experience. When Dr. Fraser retired from active practice in Paisley he became a consultant physician in Glasgow. He was at one time an examiner in medicine in the University of Glasgow and was elected F.R.F.P.S. Glasg. as long ago as 1875. Four years ago he bought a country house north of Aberdeen where he lived, for the most part, until his death. His wife died 15 years ago; he leaves a family of five daughters, one of whom, Dr. Kate Fraser, is a Deputy Commissioner to the General Board of Control for Scotland.

EX-SERVICE MEN IN ASYLUMS.—The annual report of the British Legion for 1925 states that there are still more than 6200 ex-officers and men in mental institutions, and a further 390 in the Border-line Hospital at Ewell.

THE LATE DR. R. W. WILSON.—Dr. Reginald William Wilson, who died on May 6th, was for 37 years medical superintendent of the Croydon Union Infirmary. He received his medical education at St. Mary's Hospital, qualifying as M.R.C.S. Eng. in 1882 and L.R.C.P. Edin. in 1884. At 28 years of age he was appointed the first medical superintendent by the Croydon Guardians. He leaves a widow and two sons.

RATES ON HOSPITALS.—The important Royal Infirmary at Cardiff and its branches have hitherto been assessed to local rates on a nominal basis. The assessment committee have just lowered the assessment still farther, the total of £434 being reduced to £170.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—Sir Robert Jones will read a paper at the Medical School, the University, Manchester, at 3 P.M. on Friday, June 4th, entitled Some Notes on the Treatment of Tubercular Joints. All medical practitioners who are interested are cordially invited.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL.—Arrangements have been made at Queen Charlotte's Hospital, Marylebone-road, London, for the accommodation of an increased number of medical students and practitioners, who can now be received at short notice for courses in practical midwifery.

THE LATE DR. W. STAMFORD.—Dr. William Stamford, who died on May 6th at the age of 84, was a Cambridgeshire man by birth. He studied at the Middlesex Hospital and qualified as M.R.C.S., L.R.C.P. in 1871. Nearly 60 years ago he settled in Tunbridge Wells and for 30 years was medical officer of health. In 1911 he resigned this post but continued in private practice, temporarily resuming his public work during the absence of his successor on military service in 1916. In 1912 he was elected to the town council which he served loyally until two years ago, when he had to give up the work owing to ill-health. For three years his health had been failing. Both in a public and private capacity he did good work for his town, and his interest in medical matters was shown by contributions to medical journals. He leaves a widow.

SALFORD CORONER ADOPTS NEW PROCEDURE.—Mr. A. Howard Flint, the deputy Salford coroner, opened an inquest on May 14th on a woman who died on May 11th. A young woman in custody was charged on suspicion of having caused the death. Mr. Flint adjourned the case after taking evidence of identification and the doctor's statement. He said that this was an entirely new procedure in Salford, and explained that in a Bill before Parliament dealing with the holding of inquests there was a provision enabling coroners, where a person was in custody charged with murder, manslaughter, or infanticide, to postpone an inquest pending the result of criminal proceedings. Such a course, he said, obviated the duplication of evidence, and saved witnesses unnecessary inconvenience. It was also fair to an accused person, who would not be prejudiced by anything that occurred in a coroner's court. Although the measure had not yet become law, he proposed to take the responsibility of adjourning the case until after the hearing before the magistrates.

SIR WILLIAM OSLER MEMORIAL VOLUME.—This memorial publication has just been issued under the auspices of the International Association of Medical Museums. It is an attractive volume containing 630 pages of memorial articles and bibliographic annotations with over 100 fine illustrations. Forewords have been written by Prof. William H. Welch and by the late Sir Clifford Allbutt, and the volume contains a large series of reminiscences and appreciations written by over 100 colleagues, friends, and pupils. Following this biographical and memorial section is a classified and annotated bibliography of Sir William Osler's publications, the work of several collaborators, which reveals Osler's many-sided activities and constitutes a source of reference alike to the research worker and medical historian. The book is completed by a full bibliography of writings about Osler. The volume has been privately published and is now available at the subscription price per copy of $10, or £2. Cheques should be made payable to the International Association of Medical Museums (Osler Memorial Number), and may be forwarded to Dr. Maude E. Abbott, Managing Editor, Osler Memorial Number, McGill University, Montreal, Canada, or to Sir Humphry Rolleston, Southfield, Trumpington-road, Cambridge.

HULL ROYAL INFIRMARY EXTENSION.—Mr. Philip Reckitt has given the East Mount Estate of 50 acres as the site for the proposed annexe to this hospital.

THE LATE DR. W. BRYCE.—On May 13th Dr. William Bryce, of Glasgow, died suddenly whilst walking in the street. He was 60 years old and had been in practice in the east end of Glasgow for nearly 30 years. In 1889 he graduated in medicine at the University of Glasgow and proceeded to the M.D. degree two years later. He was medical officer to the Glasgow Parish Council and had held a Territorial commission as lieut.-colonel in the R.A.M.C.

LEBANON HOSPITAL FOR MENTAL DISEASES.—The twenty-seventh annual meeting of the Lebanon Hospital, which is established at Asfuriyeh, Beyrout, Syria, will be held at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., on Tuesday, June 1st, at 4.30 P.M. (Tea at 4 P.M.) Dr. E. W. G. Masterman will preside, and all who are interested will be welcome. Particulars of the work of the Lebanon Hospital may be had from the general secretary, Miss Hilda Fox, at 67, High-street, Marylebone, London, W. 1.

ROYAL SUSSEX COUNTY HOSPITAL.—This hospital is now more than 100 years old, and at a meeting of the governors on May 18th it was decided to adopt a scheme for bringing it up to date, which will involve the expenditure of £25,000. The existing nurses' home is to be extended; new quarters are to be provided for the domestic staff, and the present operating theatres, which were put up 25 years ago, are to be enlarged. About 1500 major operations are now done during the year. Structural alterations are to be made which will increase the number of beds by 50 or 60. At present accommodation is altogether deficient; there is a waiting list of 130, and too few beds are available against emergency. A county meeting will probably be held and an appeal launched. At the governors' meeting the President, Lord Leconfield, paid a tribute to the work of volunteers who helped the hospital to carry on during the strike.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Whitsuntide Ajournment.

THE House of Commons adjourned for the Whitsuntide recess on Thursday, May 20th. They will reassemble on Tuesday, June 1st.

HOUSE OF COMMONS.

TUESDAY, MAY 11TH.

War Pensions Administration.

The House went into Committee of Supply on the Civil Service Estimates, Mr. JAMES HOPE, chairman of committees, in the chair.

On a vote to complete the sum of £63,504,900 for salaries and expenses of the Ministry of Pensions for the current year 1926–27,

Major TRYON (Minister of Pensions) said that the vote before the Committee would bring the total expenditure on war pensions up to the end of the present financial year to £725,176,986. This was the largest expenditure on war pensions made by any of the countries engaged in the Great War. The cost of administration was £1,962,900, which showed a reduction of £464,700 on last year. Ninety-seven per cent. of the money voted was spent in direct benefit to the pensioners. The number of men medically examined had fallen off greatly. In the six months ended Dec. 31st, 1922, 279,701 men were examined by medical boards; in the same six months of 1925 the number had fallen to 63,000. The staff employed in the daily work of the Ministry had declined in numbers more rapidly than the total expenditure. In 1922 the Ministry were employing 32,000 persons; on March 31st of the present year the staff had fallen to 11,358, including 3000 staff employed in the hospitals of the Ministry. Of the total male staff 97 per cent. were ex-Service men, and nearly 60 per cent. were men who had been in some degree disabled by war service. Referring to the effects of the general strike, Major Tryon said that the facilities for reaching hospitals and clinics or attending for medical examination had, of course, been affected, but he had made arrangements for providing transport where it was essential, and he was glad to say that the food supplies to the Ministry hospitals had worked

satisfactorily. Changes in local administration, which had been in process for two or three years, were now being brought to completion. These changes included the closing of the regional offices and the disappearance of the advisory councils associated with them. It was his intention to make the War Pensions Committees and the Central Advisory Committee at the headquarters of the Ministry as effective as possible in coöperation with the official administration.

He and Lieut.-Colonel Stanley, the Parliamentary Secretary to the Ministry, had visited the area offices in more than one-third of the country and had discussed with the chairman of the War Pensions Committee and the responsible medical officers and the chief area officers and their assistants the practical working of many branches of local administration. They found that generally everything was working smoothly and satisfactorily. Steps were being taken to meet practical difficulties where they occurred. The expenditure on medical services was estimated for the current year at £3,141,600, a decline of £347,000 on the previous year. The decline was due (1) to the fact that fewer men were asking for, or were being required to undergo, medical examination for pension purposes, and (2) to the medical and surgical treatment required by disabled officers and men steadily and quite naturally becoming less. The number of in-patients maintained on the charge of the Ministry was 15,000. During the past year 16 institutions belonging to the Ministry, or at their disposal, were closed, leaving 53 hospitals in working order at the present date. The largest item in the Ministry's expenditure—the cost of pensions and cash benefits of all kinds—accounted for £58,772,000 for the current year. This was a decrease of £3,177,000 on the previous year. At present, out of the whole body of a million adult beneficiaries of the Ministry, there were 750,000 disabled officers and men, widows, and adult dependents who were in receipt of final awards or other forms of life pension, and for whom practical stability of tenure as pensioners had been secured. Less than 200,000 officers and men were in receipt of conditional pensions.

Progress was reported.

THURSDAY, MAY 20TH.

Education of Semi-mentally Deficient Children.

Colonel DAY asked the President of the Board of Education what arrangements now existed for the education of semi-mentally deficient children in England and Wales.—The DUCHESS OF ATHOLL replied: My right hon. friend assumes that the hon. Member is referring to the children who are educationally retarded but are not certifiable as mentally defective. Provision is made by an increasing number of local education authorities for the education of such dull and backward children in special classes on the general lines indicated in paragraph 14 of Circular 1341.

Sanitary Condition of Offices.

Lord HENRY CAVENDISH-BENTINCK asked the Minister of Health whether the attention of local authorities had been directed by his department to the judgment in the case of Bennett *v.* Harding (1900), as to their power to inspect offices and insist on their sanitary condition; and, if not, whether he would consider the desirability of doing so.—Mr. NEVILLE CHAMBERLAIN replied: Yes, Sir, the attention of local authorities was drawn to this judgment in a Home Office memorandum of 1912. The judgment does not expressly refer to offices, and it may be well to have a test case to make the position clear.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 15TH, 1926.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 164 (last week 174); scarlet fever, 1124; diphtheria, 621; enteric fever, 32; pneumonia, 861; puerperal fever, 40; cerebro-spinal fever, 4; acute poliomyelitis, 4; encephalitis lethargica, 35; dysentery, 8; ophthalmia neonatorum, 73. There was no case of cholera, plague, or typhus fever notified during the week.

In London itself there was notified no case of small-pox; scarlet fever, 238; diphtheria, 265; enteric fever, 4; pneumonia, 103; puerperal fever, 2; cerebro-spinal fever, 3; acute poliomyelitis, 1; encephalitis lethargica, 6; and ophthalmia neonatorum, 16.

Deaths.—In the aggregate of great towns, including London, there were 3 (1) deaths from enteric fever, 60 (17) from measles, 6 (2) from scarlet fever, 48 (3) from whooping-cough, 33 (11) from diphtheria, 49 (9) from diarrhœa and enteritis under 2 years, and 118 (15) from influenza. The figures in parentheses are those for London itself.

(The Registrar-General's weekly return has not yet been printed, and we are indebted to the Ministry of Health for these figures.)

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, May 31st.—5.30 P.M., ODONTOLOGY, Clinical Meeting, followed by the Annual General Meeting: Election of Officers and Council. At this meeting it is proposed to make a presentation to Sir Frank Colyer in recognition of his devoted services as Hon. Curator of the Museum for the past 25 years.

TUESDAY, June 1st.—5.30 P.M., MEDICINE. Annual General Meeting. Dr. P. J. Cammidge: Pituitary Glycosuria. Dr. O. Leyton: Hypoglycæmia.

WEDNESDAY.—5.30 P.M., GENERAL MEETING OF FELLOWS. Sir Jagadis Bose: The Action of Alkaloids and Cobra Venom on the Pulse of the Plant and Animal. 8.30 P.M., SURGERY. Dr. W. E. Gye: The Origin of Tumours. Mr. J. E. Barnard will give a demonstration on microscopical methods.

THURSDAY.—Summer Meeting. 3 P.M., LARYNGOLOGY. Sir William Willcox: Nasal Sinusitis as a Cause of Toxæmia. (Members are requested to send cases bearing on the paper not later than 2.30 P.M.) Dr. A. Logan Turner and Dr. F. E. Reynolds: A Fatal Case of Leptomeningitis following Operation on the Ethmoidal Air Cells: with Microscopical Demonstration of the Path of Infection. Epidiascopic Demonstration: Dr. W Jobson Horne: The Rôle of the Lymphatics in Laryngeal Disease, and the Rôle of the Larynx in Lymphatic Disease.

FRIDAY.—Ordinary Clinical Meeting at 10.30 A.M. (Cases at 9.30 A.M.), LARYNGOLOGY. Cases and Specimens will be shown by Mr. Lawson Whale, Dr. D. R. Paterson, Mr. Bell Tawse, Mr. Douglas Guthrie, and others. 3 P.M., OTOLOGY: Summer Meeting. Prof. W. E. Dixon: The Permeability of the Choroid Plexus to Certain Constituents of the Cerebro-Spinal Fluid. Dr. A. A. Gray: A Hitherto Undescribed Structure in the Bird's Labyrinth.

SATURDAY.—OTOLOGY: Summer Meeting (continued). 10.30 A.M. (Cases at 9.45 A.M.). Dr. W. H. Hartridge: The Fundamental Experiments on which the Resonance Theory is Based. Cases will be shown by Mr. A. H. Cheatle, Mr. W. M. Mollison, Mr. Alex. Tweedie, Mr. M. Vlasto.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, May 31st, to SATURDAY, June 5th.—Special afternoon demonstration in clinical surgery on Monday, at the Royal Northern Hospital, by Mr. F. D. Saner at 2.30 P.M.—Special demonstration in clinical ophthalmology on Thursday, by Mr. Hepburn at the Royal London Ophthalmic Hospital at 12.45 P.M. These demonstrations are open to all members of the medical profession without fee.—CHILDREN'S CLINIC, Cosway-street, Marylebone-road, N.W. Special course in diseases of children at various Hospitals and Centres, consisting of demonstrations and lectures—morning and afternoon sessions as per programme.—MAUDSLEY HOSPITAL, Denmark Hill, S.E. Special course in Psychological Medicine now in progress—postponed owing to strike. Daily clinical instruction and lectures dealing with various aspects. Further information from the Secretary of the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, May 31st.—10 A.M., Surgical Out-patients: Mr. W. E. Tanner. 10.30 A.M., Gynæcological Operations: Mr. A. E. Giles: Throat, Nose and Ear Operations: Mr. W. Ibbotson. 2 P.M., Medical, Surgical, and Gynæcological Clinics Operations. 3 P.M., Special Demonstration of Cases in the Surgical Wards: Mr. H. W. Carson. 6.30 P.M., Venereal Department.

TUESDAY, June 1st.—2 P.M., Medical, Surgical, Throat, Nose and Ear Clinics, Operations. 4.30 P.M., Mr. E. Gillespie: The Diagnosis and Treatment of Cancer of the Breast.

WEDNESDAY.—10.30 A.M., Surgical Operations: Mr. E. Gillespie. 2 P.M., Medical, Eye, and Skin Clinics, Operations. 5.30 P.M., Venereal Department.

THURSDAY.—10.30 A.M., Dental Out-patients: Mr. E. S. Pierrepont. 2 P.M., Medical, Surgical, and Throat, Nose and Ear Clinics, Operations. 3 P.M., Demonstration of Cases illustrating the Early Diagnosis of the Infectious Fevers and their Treatment: Dr. F. Thomson at the North-Eastern Hospital, St. Ann's-road, N. 5 P.M., Operations.

FRIDAY.—10.30 A.M., Eye Operations: Mr. N. Fleming. 2 P.M., Surgical, Medical, and Children's Clinics, Operations. 3 P.M., Gynæcological Clinic. 6.30 P.M., Venereal Department.

LONDON SCHOOL OF DERMATOLOGY, ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.

TUESDAY, June 1st.—5 P.M., Dr. K. Sibley: Electrotherapeutics.

THURSDAY.—5 P.M., Dr. A. Whitfield: Eczema (1).

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY AND RESEARCH.

MONDAY, May 31st.—5 P.M., Prof. Joseph Barcroft: Recent Work on the Spleen.

THURSDAY, June 3rd.—5 P.M., Dr. C. S. Myers: Freudian Psychology.

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.
TUESDAY, June 1st.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Armour: The Surgery of Compression Paraplegia.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Hinds Howell: Disseminated Sclerosis.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Collier: Aphasia.

MANCHESTER AND SALFORD HOSPITAL FOR SKIN DISEASES, Quay-street.
THURSDAY, June 3rd.—4.30 P.M., Dr. Marianne Peach: Lupus Erythematosus.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, June 4th.—3.30 P.M. (at the Royal Hospital), Dr. G. Simpson: Treatment of Fractures.

Appointments.

CADDY A., M.D. Lond., F.R.C.S. Eng., has been appointed Ophthalmic Surgeon to the Royal National Orthopædic Hospital, Great Portland-street.

Certifying Surgeons under the Factory and Workshop Acts: BUTTAR, F. L., M.B., Ch.B. Edin. (Salisbury); BAISS, L. A., M.R.C.S., L.R.C.P. Lond. (Swanage); MACKENZIE, J. M., M.B., Ch.M. Aberd. (Newport, E. Riding); KERR, A. E., M.B., Ch.B. Cantab. (Petworth).

Vacancies.

For further information refer to the advertisement columns.

Acton Hospital.—Res. M.O. £150.
Birkenhead Education Committee.—Asst. M.O. £600.
Bolton Union, Townleys Hospital.—Med. Supt. £900. Second Asst. M.O. £225.
Bournemouth Convalescent Home.—Asst. Med. Supt. £200.
Brighton, Royal Sussex County Hospital.—H.P. £150.
Bristol, Cossham Memorial Hospital, Kingswood.—Res. M.O. £150.
Bristol Eye Hospital.—Hon. Consulting P.
Bristol General Hospital.—Hon. Clin. Assts.
Cambridge, Addenbrooke's Hospital.—H.S. and H.P. Each at rate of £130.
Cambridge University, Pathological Laboratory.—John Lucas Walker Studentship. £300.
Cardiff Royal Infirmary.—H.S. for Ear, Nose and Throat Dept. £50.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. £75
Charing Cross Hospital.—Asst. Phys. to Skin Dept.
Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100. Also Sen. H.S. At rate of £120.
Cheshire, Joint Sanatorium, Market Drayton, Salop.—H.P. £250.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Coventry and Warwickshire Hospital, Coventry.—Fourth H.S. £125.
Cumberland County Council.—Asst. County M.O.H. £600.
Derbyshire Education Committee.—Two Asst. School M.O.'s. Each £600.
Derbyshire Royal Infirmary, Derby.—Venereal Dis. O. £750.
Dreadnought Hospital, Greenwich.—Phys.
Durham County Council, Education Department.—Asst. School M.O. £600.
Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.—Asst. P.
General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.
Glasgow, Lightburn Joint Hospital, Shettleston.—Res. M.O. £350.
Great Yarmouth General Hospital.—H.S. £150.
Hampstead, General and North-West London Hospital, Haverstock-Hill, N.W.—Pathologist. £600.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £50.
Hull Tuberculosis Sanatorium, Cottingham, E. Yorks.—Res. M.O. £504 13s. 10d.
Huntingdon Administrative County.—Asst. County M.O. and Asst. Sch. M.O. £600.
Leicester Royal Infirmary.—H.S. At rate of £125.
London Hospital, E.—Hon. Asst. Anæsthetist. Also Hon. Anæsthetist.
London Temperance Hospital, Hampstead-road, N.W.—Res. M.O. At rate of £175.
Manchester, Hospital for Consumption, &c.—Hon. Asst. P.
Mauritius Government Mental Hospital, Beau Bassin.—Asst. Med. Supt. 7500 rupees.
Metropolitan Hospital, Kingsland-road, E.—Hon. Anæst. Also Ophth. S.
Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. Cas. O. £150. H.S. £125.
Oxford, Radcliffe Infirmary and County Hospital.—H.S., Obstetric H.P. Each at rate of £120.
Queen Mary's Hospital for the East End, E.—H.P., two H.S.'s, Obstet. H.S., and one H.P., and Cas. O.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Cas. O. At rate of £100.
Royal Northern Hospital, Holloway, N.—Ophth. S.
St. John's Hospital, Lewisham.—Asst. S. in Ear, Nose and Throat Dept.
Sheffield Royal Hospital.—Sen. Cas. O. £150.
South London Hospital for Women, South Side, Clapham Common, S.W.—Asst. P.
Stoke-on-Trent City.—Asst. M.O. £500.
Sudan Medical Service.—Four M.O.'s. £E.720.
Swansea Hospital.—H.S. for Ophth. and Aural Depts. £200.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Sen. Res. M.O. £250.
West London Hospital, Hammersmith, W.—H.P., H.S., Aural H.S., and Res. Cas. O. Each at rate of £100.
Westminster Hospital, Broad Sanctuary, S.W.—Asst. H.P. &c. At rate of £52.
Winchester, Royal Hampshire County Hospital.—H.S. At rate of £150.
Windsor, King Edward VII. Hospital.—Res. M.O. and Jun. H.S. At rate of £200 and £100 respectively.

The Secretary of State for the Home Department announces a vacancy for a Medical Referee under the Workmen's Compensation Act, for the Districts of the Doncaster and East Retford County Courts (Circuit No. 18). Applications from Surgeons should reach the Private Secretary, Home Office, London, S.W., not later than June 14th.

Births, Marriages, and Deaths.

BIRTHS.

ANDERSON.—On May 15th, at Rosemount, Bearsted, Kent, the wife of J. C. Anderson, M.D., of a daughter.
BANKS.—On May 16th, at Ty-Mawr, Aberdare, the wife of Harry Banks, F.R.C.S., of a daughter.
BLACKLEY.—On May 12th, at Ashton-on-Ribble, Lancashire, the wife of F. J. Blackley, M.D., of a daughter.
CLAPHAM.—On May 21st, at Madeley House, Park-road, Peterborough, the wife of Harold Clapham, M.R.C.S., L.R.C.P., of a daughter.
HEPPLE.—On May 20th, at Chelsea, the wife of Captain R. A. Hepple, M.C., R.A.M.C., of a son (prematurely).
RAISON.—On May 13th, at Prior's Croft, Sir Harry's-road, Edgbaston, Birmingham, the wife of Cyril A. Raison, F.R.C.S., of a son.
SEVERN.—On April 20th, at Hong-Kong, the wife of Dr. A. G. Millott Severn, of a son.
SHAW.—On May 10th, at Christ Church-road, S.W., the wife of Dr. J. G. Shaw, of a son.
STEWART.—On May 10th, at Dial House, Bourton-on-the-Water, Glos., the wife of Dr. R. B. Stewart, of a daughter.

DEATHS.

AMSDEN.—On May 24th, at Lancaster-gate, Walter Amsden, M.R.C.S., F.R.G.S., aged 66.
CROCKER.—On May 17th, very suddenly, John Hedley Crocker, M.D., B.Ch., D.P.H., of "Kingswood," Surrenden-road, Brighton, late Medical Officer of Health for Richmond, Surrey.
DUTCH.—On April 30th, 1926, after a long illness, Major Henry Dutch, M.D., T.D., aged 64 years, at his residence, 8, Berkeley-street, W. 1, beloved husband of Minna N. Dutch and deeply loved father of Councillor Miss Hilda Dutch.
FRASER.—At Woodlands, Elderslie (the residence of his son-in-law), on the 19th inst., in his 86th year, Donald Fraser, M.D., F.R.F.P.S., late of Paisley and latterly of Connel Ha' Cothal, Aberdeenshire.
HARVEY.—On May 4th, at Hamilton, Bermuda, Eldon Harvey, O.B.E., V.D., M.R.C.S. Eng., L.R.C.P. Edin., in his 74th year.
HOWARD.—On May 19th, at the Mowle, Ludham, Norfolk, Arthur Dashwood Howard, M.D.
KEMPSON.—On May 10th, suddenly, Frederick Claude Kempson, M.B. Cantab., Vicar of St. Newlyn East, Cornwall, aged 58 years.
KENYON.—On May 20th, at St. Margaret's-terrace, John Edward Kenyon, M.R.C.S., L.R.C.P., aged 79.
PACKARD.—On May 21st, at Kedleston, the Rev. Henry Charles Packard, M.D., Rector of Kedleston, Derby, in his 70th year.
SHAW.—On May 3rd, at "The Leazes," Goodmayes, John Custance Shaw, Medical Superintendent, West Ham Mental Hospital, aged 59.
THOMPSON.—On May 18th, at Beaumont-street, Oxford, after a few hours' illness, Harold Thompson, M.R.C.S., L.S.A., aged 73.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

LEICESTER ROYAL INFIRMARY.—The annual report contains some interesting comments upon the influence of trade depression on workmen's contributions which, in this instance, show a slight falling off after years of consistent growth. Had it not been for the diversity of manufacturing interests in the city the financial uncertainty of the year would have been much greater. About 60 per cent. of the adult in-patients are members of approved societies which have granted support in relation to about 40 per cent. of their members treated in the hospital, and it is pointed out that if all approved societies with surpluses adopted hospital benefits the total contributions would yield some £7000 towards the £30,000 which the institution spends on the treatment of insured persons. A preponderating percentage of out-patients are members of approved societies which, however, make no return except by small annual contributions in a few instances.

Notes, Comments, and Abstracts.

THE DANGEROUS DRUGS ACTS.

THEIR APPLICATION BY THE PHYSICIAN AND THE PHARMACIST.*

BY SIR WILLIAM WILLCOX, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P. LOND.,
PHYSICIAN TO ST. MARY'S HOSPITAL, LONDON.

ADDICTION to the "dangerous drugs" to which the special Acts relate is rare in Great Britain. I made this statement in the Norman Kerr memorial lecture in 1923, and the same conclusion was reached by the Departmental Committee on Morphine and Heroin Addiction, which issued its report in January of this year.

It is often asked: Why should all these troublesome laws and regulations be made to deal with a condition which is uncommon in the country? The answer is that "the Dangerous Drugs Acts" are the outcome of a profound international public opinion which for many years has been steadily growing.

Movement to Restrict the Use of Dangerous Drugs.

As long ago as 1788 Warren Hastings declared opium to be "a pernicious article of luxury which ought not to be permitted but for the purpose of foreign commerce only," and in 1817 the directors of the East India Company wrote that "if it were possible to prevent the use of the drug altogether, except strictly for the purpose of medicine, we would gladly do it in compassion to mankind."

In 1874 the British Society for the Suppression of the Opium Trade was formed with Lord Shaftesbury as its first president, and in 1893 a Royal Commission was appointed to consider the opium problem in India. Although, however, the gravity of opium addiction was fully realised by this Commission no active measures of importance resulted from its work.

The United States became directly concerned in the Far Eastern opium problem when the Philippine Islands were ceded to them by Spain in 1898, and the International Opium Commission of Shanghai in 1909 was largely the result of President Roosevelt's initiative. This was the first great step in dealing with the problem from an international standpoint. An attempt to carry the work a step further was made at the International Opium Convention at The Hague in December, 1911, and January, 1912, and a general course of action was agreed upon, to which the 12 countries coöperating gave sanction. It was not, however, to become effective until the other countries not participating had agreed, and a satisfactory result was delayed by the outbreak of the war.

The peace treaty of Versailles contained clauses leading to the ratification of the Opium Convention. Under the terms of the Convention the consenting nations agreed to frame Acts dealing with dangerous drugs, and in this country the Dangerous Drugs Act was passed in September, 1920, by which (Section 7) power was given to make regulations to control the manufacture, sale, possession, and distribution of the drugs in question. Minor regulations and amendments were made, and in May, 1923, the Dangerous Drugs and Poisons Amendment Act was passed. In March of the same year a memorandum on the duties of doctors and dentists under the Act of 1920 was issued by the Home Office.

In July, 1916, under the Defence of the Realm Act, orders were made dealing with the sale of opium and cocaine which were similar in character to those of the Dangerous Drugs regulations of 1921, and in May, 1916, an Army Council Order under the same Act prohibited the sale of certain narcotic drugs to any member of H.M. Forces except in the dispensing of medical, dental, or veterinary prescription. This schedule of narcotic drugs included barbitone, codeine, Indian hemp, benzamine (i.e., eucaine), chloral hydrate, sulphonal, and their preparations and derivatives.

These war emergency regulations dealing with dangerous drugs and narcotics worked smoothly and satisfactorily, and their success paved the way to the issuing of the dangerous drugs regulations of 1921.

Recent Developments in Great Britain.

It will be interesting to note the further developments in relation to the Dangerous Drugs Acts, though these have not yet resulted in actual statutory regulations.

In April, 1923, a Departmental Committee, with Dr. Smith Whitaker as chairman, was appointed by the Minister of Health to investigate the value for therapeutic purposes of possible substitutes for cocaine and the risk of such substitutes becoming drugs of addiction. This committee has not yet issued its report, but very valuable original work has been done at Cambridge, which has resulted in the discovery of the borocaines. These are valuable substitutes for cocaine; they are much less toxic and it is believed that they will not give rise to addiction.

In September, 1924, a Departmental Committee, with Sir Humphry Rolleston as chairman, was appointed by the Minister of Health to inquire into morphine and heroin addiction, and specially to consider the circumstances under which these drugs may be supplied to persons suffering from addiction and the precautions necessary to avoid abuse. This committee issued its report on Jan. 21st, 1926. Its work has been of great value, since it has enabled the views of specially experienced members of the medical and pharmaceutical professions to be heard in detail and impartially considered and reported upon.

Not the least valuable part of the report is the definition of addict as "A person who, not requiring the continued use of a drug for the relief of the symptoms of organic disease, has acquired as a result of repeated administration an overpowering desire for its continuance, and in whom withdrawal of the drug leads to definite symptoms of mental or physical distress or disorder."

The committee pointed out the types of cases of addiction in which administration of morphine or heroin may be regarded as legitimate medical treatment. This relieves the physician and pharmacist of any possible suggestion of lack of care. Consultations in certain cases were recommended, and it was suggested that infringement of the regulations by medical men should be dealt with by a specially constituted medical tribunal as an alternative to a conviction in the courts. It was also recommended that in suitable cases the Home Secretary should have power to withdraw a practitioner's authorisation to prescribe dangerous drugs as well as to possess and supply them, and it was recommended that doctors who do not dispense should be required to keep a simple record of their purchases of dangerous drugs. The system of notification of addicts which exists in certain countries was given full consideration, and it was not considered desirable to recommend such a system for this country.

On Feb. 11th, 1925, at the first Opium Conference of the League of Nations, special recommendations were made which made the importation, sale, and distribution of opium a monopoly of the Government. On the 19th, at the second Opium Conference of the League of Nations, special recommendations were made whereby *all* preparations containing heroin of whatever strength and galenical preparations (tincture and extract) of Indian hemp should come under the operation of the Dangerous Drugs Act and Regulations. The above recommendations have not yet been legalised in this country.

What are the Dangerous Drugs?

As at present scheduled they are morphine, cocaine, ecgonine, heroin, and medicinal opium with their salts or preparations. Additions to these have been suggested.

Codeine.—Is this a dangerous drug? or, in other words, is its use likely to lead to addiction? In my opinion codeine should not be regarded as a dangerous drug. It is a drug which is taken almost always by the mouth, and is not administered hypodermically. In the course of an extensive toxicological experience I have never yet met with a case of codeine addiction. I have, during the past 25 years, frequently prescribed codeine, usually in combination with other analgesic drugs such as aspirin, phenacetin, or pyramidon for the relief of pain, and have never observed any signs of the development of addiction. The addition of codeine to the list would greatly restrict the use of a valuable remedy and would cause needless inconvenience and hardship.

Suggestions as to certain further additions to the list of dangerous drugs have been received from other countries. The *veronal group* of drugs—i.e., diethyl barbituric acid and other alkyl, aryl, or metallic derivatives of barbituric acid such as veronal, medinal, dial, proponal, luminal, and their preparations or compounds—are, in my experience, drugs which commonly lead to the development of addiction. They are toxic drugs and produce cerebral symptoms and an abnormal mental condition. Death from poisoning from the barbituric acid group of drugs is relatively common. A common sequel of véronal addiction is suicide from an overdose. I have seen a number of such cases. I am strongly of opinion that this group of drugs should only be supplied on medical prescription, and that the prescription should be retained by the pharmacist as in the case of the "dangerous drugs." In other words, Sections 5 and 6 of the Dangerous Drugs Regulations, 1921, should apply to these drugs. The addition of a drug to the "Dangerous Drugs Regulations" involves many more conditions other than those of these two sections, and it does not appear necessary that these other conditions should apply to the veronal group of drugs. It would appear desirable that such restrictions as regards

* Abstract of an address to the conjoint meeting of the South-West London Medical Society and the South-West London Chemists' Association on May 5th, 1926.

the sale of these drugs should apply as was the case during the war, without their actual inclusion under the Dangerous Drugs Act and all that that involves. The situation might be met by the framing of special regulations by the Pharmaceutical Society under Section 1 of the 1868 Pharmacy Act.

Heroin.—It has been suggested that heroin should be abolished and its manufacture prohibited. Heroin has therapeutic effects which are not supplied by morphine or other drugs. Thus it is often more effectual in the relief of severe nerve pain. It does not cause constipation. In some cases where morphine is not tolerated, causing vomiting or excitement, heroin acts as a perfect hypnotic. For these reasons it is held that heroin should be retained as a therapeutic remedy. The dangers of addiction from its continual use must never be forgotten.

Illegal Trafficking in Dangerous Drugs.

Illegal trafficking appears to be much less in this than in other countries. A certain amount of illegitimate sale of cocaine and heroin undoubtedly occurs, as is seen from newspaper reports. This mode of contravention of the law appears to be more common amongst the vicious group of addicts—i.e., those who take the drugs for the purpose of producing pleasurable sensations or vicious indulgence. This aspect of drug addiction comes under the notice of the police more often than under that of physician or pharmacist.

Mr. John Palmer Gavitt, in his recent book, states that the world production of opium is more than ten times the outside possible legitimate needs of the world. He stresses the importance of effective control of the production of raw opium so that there would not be available a large surplus for illegitimate uses. The same argument applies to coca leaves. The control of the production of the plants from which the dangerous drugs are derived is difficult since often questions of national revenue and finance are involved, and in countries such as China, where the Government is unsettled, effective control of production is impossible.

It has already been pointed out that the institution of the Dangerous Drugs Acts and their consequent Regulations arose from international action, and that the problem of drug addiction from the standpoint of this country alone was not of such grave and pressing importance as to call for the passing of special Acts for its control. We must, however, view the subject of drug addiction from an Imperial standpoint. The British Empire is world-wide in its extent and interests, and includes countries such as India where a large proportion of the plants are grown from which the dangerous drugs are derived. Great Britain, therefore, on account of its Imperial interests is vitally concerned in the problem of the control of the dangerous drugs.

Another aspect of the question must not be lost sight of. Drug addiction is a disease which is infectious, one person influencing another. Though addiction is not common in Great Britain it is prevalent in some other countries. For example, it was estimated by a special committee that in 1918 the number of drug addicts in the United States exceeded one million, and in New York City the health officer reported a prevalence of 1·8 per cent. of the population. It is thus clear that drug addiction is prevalent to a serious extent in the United States. There is a real danger of the spread of drug addiction to this country, and on this account as well as for Imperial reasons it is necessary that Great Britain should play an active part in the fight against this world menace.

The Regulations.

The application of the Dangerous Drugs Acts to this country is evinced by the Regulations which have been drawn up. The Regulations of May, 1921, and the subsequent amendments were very carefully considered by the Home Office authorities, and the representations of the professions of medicine, dentistry, veterinary surgery, and pharmacy were given the fullest consideration. The Home Office authorities, amongst whom Sir Malcolm Delevigne should be specially mentioned for his devoted attention to this difficult subject, did their utmost to meet the wishes of those concerned, consistent with the effective drawing up of the regulations required by the terms of the Convention. It cannot be claimed that these Regulations are at present perfect, but they have been drawn up in a spirit of justice and fairness to all concerned. As regards avoidance of harshness of operation on the professions mentioned, and, what is of equal importance, on the addicts affected, the Regulations are a model to other countries. I know also that moderation and restraint have been shown, as far as possible, by the Home Office authorities and the Ministry of Health in carrying into effect the principles of the Regulations.

In the difficult position created by the Dangerous Drug Regulations it must be borne in mind that the object for which they were framed can only be satisfactorily attained by the loyal coöperation of the professions concerned with the State authorities. Drug addiction, to quote the words of the Departmental Committee on Morphine and Heroin, should with few exceptions be regarded as a manifestation of a morbid state, and not as a mere form of vicious indulgence. It is in this spirit that the Regulations in this country have been framed. They contrast favourably with the Regulations in America and some other countries where drug addicts are regarded as wilfully vicious persons, and are notified to the authorities before drugs can be supplied to them. Doctors even have to obtain a special licence to prescribe the dangerous drugs.

Application of the Acts to the Pharmacist.

The pharmacist is much more closely affected by the Dangerous Drugs Acts than is the physician. For purposes of manufacture, import, and export, he is subjected to a very rigid control and needs a special licence. The Regulations made under Section 7 of the 1920 Act involve most careful registering of every prescription coming under their scope and of all sales and purchases. The onus of detecting forged prescriptions appears to rest with the pharmacist (Section 6 of the Principal Regulations and Section 3 of the Statutory Rules and Orders 1923, No. 312). It is stated that a prescription shall only be dispensed if the person dispensing the prescription is acquainted with the signature of the medical practitioner, registered dentist, or registered veterinary surgeon by whom the prescription purports to be given, and has no reason to suppose that the prescription is not genuine or if he has taken reasonably sufficient steps to satisfy himself that the prescription is genuine. When one considers the difficulty of deciphering the signatures attached to some prescriptions one can form some idea of the difficulty and responsibility devolving on the pharmacist.

It is a common occurrence for prescriptions coming under the purview of the Dangerous Drugs Acts to be written in such a manner that the Regulations are not fully complied with. When these are presented to the pharmacist he is put to not a little trouble and inconvenience before matters can be rectified, and the patient suffers by unnecessary delay. Sometimes questions arise which involve a very intimate knowledge of the Acts and Regulations. To quote one example: Pulv. ipecac. Co. B.P., or Dover's powder, is excluded from the scope of the Act, but a prescription of equal parts of Dover's powder and some harmless drug such as aceto-salicylic acid has been held to come within the scope of the Act—i.e., to be a "dangerous drug." Delivery to messengers of dispensed medicines adds further responsibilities to the pharmacist.

The Regulations applying to hospitals and public institutions have been framed so as to work efficiently and satisfactorily, but they nevertheless add a heavy load of responsibility and labour to the pharmacist. The pharmacist is liable to inspection of his records at any time by official inspectors, who may not have had a special training in pharmacy. In the case of medical men inspectional visits are usually carried out by medical officers of the Ministry of Health, and this considerably lessens the inconvenience caused by the inspection. It would add greatly to efficiency and also to the convenience of pharmacists if official inspections were conducted by officers who were qualified pharmacists.

Lastly, and most important to the pharmacist, is the financial sacrifice involved upon him by the Dangerous Drugs Acts. For many years he had been legally entitled to sell the dangerous drugs and their preparations under the conditions laid down in the Pharmacy Acts. In May, 1921, this right was withdrawn from him. All honour is due to the loyal coöperation of the pharmaceutical profession for their giving up without complaint a privilege and right to which they had been legally entitled.

Application of the Acts to the Physician.

The physician who dispenses remedies coming under the scope of the Acts is required to keep a record of the medicines supplied by him. In the case of physicians who prescribe but do not dispense, special conditions are laid down as regards the writing of the prescription, and it must be signed with his usual signature and address. "Official forms" have not, up to the present, been ordained by the Secretary of State. A physician who prescribes dangerous drugs need not keep any record of his prescription. A physician may write a prescription for his own use (Reg. 1923, No. 577). The application of the Dangerous Drugs Acts and their regulations causes little or no inconvenience to the physician who prescribes only. All that is required of him is care in the details of the writing of his prescription. In the case of the physician who dispenses a certain amount of inconvenience is caused in the keeping of the records of those medicines which come under the scope of the Act, and these records are also liable to inspection.

In the case of the pharmacist the application of the Acts is vastly different. He is deprived of his long-standing and vested right to sell dangerous drugs and their preparations under the Pharmacy Acts. He is subjected to a number of carefully detailed regulations as regards the sale and supply

of the drugs. He has to bear the onus of blame where fraudulent prescriptions are inadvertently dispensed. He is saddled with a great amount of very responsible clerical work in the keeping of records. He has to bear the trouble of rectifying matters when prescriptions are presented to him which do not comply in every detail with the Regulations. And lastly, should any infringement of the provisions of the Acts or their Regulations occur he is liable to enormous penalties.

A perusal of the penalties for offences against the Dangerous Drugs Acts (vide Dangerous Drugs and Poisons Amendment Act, 1923) is enough to cause alarm and astonishment. For conviction on indictment a fine not exceeding £1000 or penal servitude for 10 years, or both such fine and penal servitude. On summary conviction a fine not exceeding £250 or imprisonment with or without hard labour for a term not exceeding 12 months, or both such fine and imprisonment. The magnitude of these penalties is due to the recommendations of the International Convention. One cannot but feel that they are ridiculously excessive.

To sum up the application of the Dangerous Drugs Acts. To the physician they have caused some inconvenience if he dispenses his own medicine. To the pharmacist they have caused a greatly increased amount of responsible clerical work, a burden of heavy responsibility especially in the case of dispensing where fraud is attempted, and a definite financial sacrifice.

Conclusion.

In view of the great inequality of effect of the Acts on the medical and pharmaceutical professions, it appears that it would be equitable that the dangerous drugs should only be supplied on medical prescription, and that they should not be dispensed by a medical practitioner except in cases of emergency or in rural districts where a pharmacist is not available. This procedure has been in operation in the case of insured patients since the adoption of the National Health Insurance Act and it has worked admirably. It would, I think, involve no financial sacrifice on the part of the medical practitioner and would relieve him of troublesome clerical work. The double check—viz., the writing of the prescription by the physician and the dispensing by the pharmacist—would be in the interests of the public for there would be a double safeguard against any possible error. It would be the first step towards that harmonious relationship and coöperation between the professions of medicine and pharmacy which should be arrived at in all their associations, viz.:—

The physician should prescribe and not dispense.
The pharmacist should dispense but not prescribe.

MIND AND BODY.

THE relationship between mind and body has attracted the speculations of the philosophers throughout the ages, but it is only of comparatively recent times that any attempt has been made to approach the problem of the mind-body relationship by submitting to laboratory examination any of the curiously complex processes involved. The asthmatic's artificial rose, hysterical contractures, and the psychic flow of gastric juice are well-known instances of the influence of mind on body. Fear as an emotion can produce great bodily disturbance, and it is possible that the phrase "frightened to death" contains more than an element of truth. A better understanding on the part of the public of the underlying processes and principles governing the relationship of mind and body will help the practitioner to convince his patients and their friends of its importance. An excellent guide for the general reader will be found in a recent little book by Prof. John Laird.[1] Starting from the common-sense attitude that our minds and bodies are entirely different, Prof. Laird traces the evidence for the mind's influence upon the body and the more obscure general influence of bodily health upon mental function, both from the physiological and psychological points of view. Prof. Laird criticises severely much of Freud's work on the unconscious, and goes on to deal with the psycho-biological theories of Rivers and other workers in the field of hysteria. Much recent physiological research has also been skilfully summarised in a few pages. The facts thus set out form the basis for various hypotheses concerning the connexion between the mind and the body, and the hypotheses considered appear to be of three essential types. "Either the mind depends on the body or the body depends on the mind, or the two are independent although conjoint." The arguments for and against these various hypotheses are faithfully dealt with and the theory of parallelism between mental and neural processes which denies interaction receives much attention.

The general reader, for whom this book is primarily intended, will have difficulty in following some of the metaphysical theories considered by Prof. Laird, but those who are prepared to give patient study to this book will certainly widen their philosophical outlook.

[1] Our Minds and Their Bodies. By Prof. John Laird, Regius Professor of Moral Philosophy in the University of Aberdeen. London: Humphrey Milford, Oxford University Press. 1925. Pp. 122. 2*s.* 6*d.*

AMPUTATION: A LEGAL DECISION.

THE *Matin* (May 11th) publishes the following report from its Brussels correspondent. A certain negro king was obliged to have a leg amputated on account of a serious accident. When the operation was over he asked for his leg back so that he might eat it. The doctor, who was a white man, refused his patient's request on the ground that cannibalism is not allowed in the Congo. The king, however, engaged a lawyer and brought the doctor and staff of the hospital before the court at Boma, insisting that they should return his property; and when the court had heard the plea it decided that the hospital must certainly restore the leg to its owner.

THE PUBLIC SCHOOLS YEAR-BOOK, 1926.

PARTICULARS of the public schools of the United Kingdom, arranged in alphabetical order, form the greater part of the contents of the Public Schools Year-Book (1926, London, H. F. W. Deane, pp. 927, 10*s.* 6*d.*). There follow entrance scholarship announcements for 1926, regulations for the entrance examinations to the universities, and brief notes on the individual universities and colleges of the United Kingdom. The rest of the book describes the various careers open to young men, and the ways in which candidates for professions of all kinds can enter them. The 30 pages allotted to medicine include a comprehensive list of scholarships given in aid of medical study and will be found useful by parents with gifted sons.

PNEUMONIC PLAGUE IN SIBERIA IN 1921.

Dr. H. M. von Jettmar, of the North Manchurian Plague Prevention Service at Harbin, has made some remarks on Pneumonic Plague in Siberia in 1921,[1] which are of interest. A Chinese coal-miner, of Dalai Nor, took pneumonic plague on Jan. 25th and infected a Cossack, B., who slept a night at his house. B. crossed the Argun river into Russian territory, where he fell ill on Jan. 30th and died on Feb. 2nd without medical aid. Throughout his illness he lay on his side, coughing towards his room, which later was found widely fouled with sputum. All the ten soldiers who regularly slept in his hut of nights caught plague and died. B.'s sister turned up to see his corpse and was interned in the hut till all the deaths were over. She wore a mask and carried out the other protective regulations and was not attacked. B.'s sister-in-law came to see him, yet alive, on Feb. 1st, fell ill on the 4th, and died on the 6th. In her smaller room there were four other persons, none of whom became infected, though her sputum was on the 6th an almost pure culture of plague bacilli. She lay on her bed behind a low partition with her face throughout to the wall, on which her sputum fell. This relation of position to infection has, we are told, been noticed by Kitasato and others. At this time incubation was generally three days, but might extend to five, or even eight. Invasion was sudden. The sputum was not infectious at the very first, but soon became so, and ever more and more (more and more bacilli) as the case went on. Cases lasted two and a half to three days. Dr. von Jettmar did eight post-mortem examinations which were all much as usual, though all showing a long bacillus, very numerous, in addition to the plague bacillus. It was most frequent in the subpleural connective tissue, but never appeared in the sputum. Another autopsy had special interest. P. fell suddenly sick on the evening of Feb. 18th, and in the early morning went into an outhouse and hanged himself. The temperature was about −15° F., and his body was forthwith frozen stiff, thus giving special opportunity to study, six hours later, the appearances in an early case of pneumonic plague. So Dr. v. Jettmar is able to tell us that there was already advanced consolidation of the middle lobe of the right lung, and it was commencing in the upper lobe. He gives seven closely-printed pages of his histological findings, but we have, we regret, only room to say that he finds no reason for supposing that pneumonic plague is primarily a septicæmia; on the contrary, he thinks it is at first localised in the air passages of the lungs. Even on the first day large areas of lung are hepatised. In the early stage there is much effusion into the alveoli of blood serum and cellular exudate, through this the bacilli are uniformly distributed, only later tending to gather on the alveolar walls. There are no bacilli in the blood-vessels, but they are seen in the lymph spaces around vessels and bronchi. The long bacillus was not found in this case, only the plague bacillus; an unusual finding in this particular epidemic. In this very early stage the usual necrosis of tissue was conspicuously absent. There were no bacilli in the spleen.

[1] Archiv für Schiffs- und Tropen-Hygiene, November, 1925, p. 650.

DIETETICS.

A LITTLE book [1], based upon the diagram of a "square meal," which was first published in a pamphlet for the People's League of Health, is concerned principally with the three vitamins and with protein, which form the four corners of the square in the diagram. After a short historical chapter, in which the sins of civilisation are emphasised, and a general chapter on the purpose and nature of food, Prof. and Mrs. Plimmer proceed to deal in some detail with the various deficiency diseases. Throughout they bring out their thesis that while absence of this or that factor produces a definite disease, relative absence may produce minor disturbances of health which may in turn culminate in more serious maladies such as diabetes or cancer. We would point out that eminent dietitians have protested against this view. The return to natural foodstuffs, so-called, by the population at large would probably not be an unmixed blessing despite the attractive arguments advanced in this book and elsewhere, but we may nevertheless admit that "civilisation has made it too easy to get wrong foods of all kinds." At any rate, the plea for a better balancing of the diet in the "square meal" is one which can be thoroughly endorsed, and this little book makes quite clear what this balance means.

RECTAL FEEDING.

IT is not uncommon to consider that adequate nourishment, at any rate the best obtainable under the circumstances, is provided by an enema containing milk and egg. Mr. S. W. Cole points out, in the April number of the *Charing Cross Hospital Gazette*, that egg-white per rectum is entirely useless since the only proteolytic enzyme secreted by the large intestine is erepsin, which is normally utilised to split the peptones and polypeptides, formed by gastric and tryptic digestion, into free amino-acids, in which form they can be absorbed by the blood. The proteins of egg are therefore returned unchanged except for partial decomposition by the bacteria. The casein of milk is partly digested by its previous peptonisation to a mixture of amino-acids and caseoses, and these latter are susceptible to erepsin. Milk, therefore, probably yields an appreciable amount of assimilable protein before it is returned by the bowel. But the whole yield of protein from 6 oz. of diluted peptonised milk is not more than 1 g., and the milk cannot be used stronger because of the slow action of trypsin on undiluted milk. Now the recognised standard figure for adults is 100 g. per diem, and the administration of 1 g. of protein in a nutrient enema, even if four are given daily, is manifestly futile. Mr. Cole suggests the use of a broth which he has used in his Cambridge laboratory for many years. It is made by shaking 200 g. of commercial casein with 2 litres of water and adding caustic soda to dissolve the casein and bring the solution to pH = 8·1, the optimum reaction for trypsin. It is then incubated with strong tryptic extract, and some antiseptic such as chloroform or toluol, for 8 to 14 days at 40° C. The resulting filtrate is stable and contains about 9·5 per cent. of digested protein, about 50 per cent. of which is in the form of free amino-acids. Thus, if four enemata of this solution were given daily, about 64 g. of protein would be absorbed. Mr. Cole urges the trial of this solution in surgical or obstetrical cases requiring rectal feeding, and also in some forms of anæmia where the failure of digestion or absorption gives the intestinal bacteria more than their normal chance of destroying the amino-acids or converting them into toxic compounds. The free amino-acids thus provided might be absorbed before the flora of the bowel had time to attack them.

THE TRUTH ABOUT BORSTAL.

THERE is a point of view from which Borstal institutions are regarded as part of a degraded and brutal system; whilst from another they appear to be organisations managed by sentimentalists for the purpose of coddling young criminals who would be better dealt with in the way that all right-minded people would deal with all such scoundrels. Stimulated by these contrary views, Mr. Moseley [2] set out to find what the institutions really were and what they did. He familiarised himself with the procedures by which offenders were sent to them, he sought out those who had the management of the system, and he visited the different establishments to obtain first-hand information from their inmates. The result is a simple account of the development of the four institutions at Rochester, Feltham, Portland, and Aylesbury, with their achievements in the reclamation of social misfits before they became irreclaimable. He concludes that there has been a vast improvement in the Borstal system in recent years, that it is now sensible and humane, and that the difficult problem of the delinquent adolescent is being fairly well met though there remains room for further reforms, especially in selection and classification. The book is well illustrated and its balanced presentation of facts justifies its title.

TROPICAL HYGIENE FOR SCHOOL CHILDREN.

"In the tropics," says Dr. Mary Blacklock, of the West African Medical Service, "we may still see a schoolboy, ignorant of the cause of malaria, clasping a book of Euclid close to his enlarged malarial spleen, and may still hear a learned B.A. discoursing eloquently on the philosophy of John Stuart Mill, the while mosquitoes breed in the roof gutters of his house and rats scamper over the refuse heap in his yard." In their attempts to promote the public health sanitarians are constantly thwarted by the ignorance of the people, and it is to meet the need for simple instruction that Dr. Blacklock has written "An Elementary Course in Tropical Hygiene," of which the first part has been published for the Tropical Diseases Bureau by John Bale, Sons and Danielsson, Great Titchfield-street, London, W., at 1s. (pp. 44). Dr. Andrew Balfour contributes a preface and we agree with him that this primer is well adapted to the needs of the child mind. It is in two divisions. The first is a series of lessons on the things which keep the body healthy and things which make it unhealthy. The second is in story form and is told in such a way as to interest any children who can understand simple English. Dr. Blacklock has added drawings of some of the principal enemies of man, and the handbook will certainly be useful in the hands of any reasonably intelligent teacher.

J. D. D. has omitted to enclose his address.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee 30 cases were considered and £188 voted to 28 applicants.

Daughter, aged 49, of M.D. Edin. who was a retired colonel in the A.M.S. and died in Devonshire in 1919. She has tried to maintain herself, but owing to ill-health and bad eyesight has had to give up work and is now living on her capital which only brings in £17 per annum at the present time. Friends gave £12 and she received £2 10s. as a lady help for two months. Voted £20 in four instalments.

Daughter, aged 70, of M.R.C.S. who practised in Norfolk and died in 1868. Applicant has worked as a children's nurse for 24 years; since as a housekeeper until recent illness. Now unable to do anything. Is applying for the Old Age Pension. Only income £2 17*s.* 6*d.* per annum. Lives with a friend who is unable to keep her. Voted £26 in 12 instalments.

Daughter, aged 62, of L.S.A. who practised in London and died in 1914. She has a small nursing home, but owing to the bad condition of the house is unable to get patients. Has borrowed money to meet rent of which £6 2*s.* is still outstanding. Received from patients £103. Rent £56, rates £20. Voted £10.

Widow, aged 55, of L.S.A. who practised in London and died in March. Applicant's late husband was over 80 years of age and needed constant attention, which precluded the applicant from earning. She is now looking out for a post and the Fund granted her £15 to meet outstanding rent and to carry her on whilst seeking work.

Widow, aged 40, of M.B. Glasg. who practised in Wales and died in 1924. Asks for help with her son, aged 15, who through the influence of friends is now apprenticed to a firm of engineers. This boy is now in charge of a guardian as the applicant is lying seriously ill in an infirmary. Guardian voted £26 in 12 instalments towards maintenance of the boy.

M.R.C.S. Eng., aged 56, who was in the A.M.S. and owing to mental breakdown will be unable to work again. Relations subscribe to the support of the applicant but one has recently retired from his profession and is unable to continue his contribution. Fund voted £30 in 12 monthly instalments in May, 1925, and the amount was renewed at this meeting of the Committee.

Daughter, aged 53, of M.R.C.S. Eng. who practised on the East Coast and died in 1908. Very delicate and unable to work. Lived with her mother (who was a pensioner of the Fund) until she died in 1922. The applicant has received £93 from the Fund since 1920 and her grant of £18 was renewed.

Daughter, aged 44, of M.R.C.S. Eng. who practised in Yorkshire and died in 1906. Has been an invalid since the death of her father and is looked after by a nurse who receives 15*s.* a week for her maintenance. A brother-in-law has helped to keep her at the home, but owing to his inability to find all the money the Fund was asked to help. £175 has been granted since 1919 and the grant of £26 in 12 instalments renewed.

Subscriptions may be sent to the Hon. Treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, W. 1.

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[1] Food and Health. By R. H. A. Plimmer, D.Sc. Lond., Professor of Chemistry in the University of London; and Violet Plimmer. London: Longmans, Green and Co. 1925. Pp. 64. 2*s.*

[2] The Truth about Borstal. By Sydney A. Moseley. London: Cecil Palmer. 1926. Pp. 165. 6*s.*